

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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GUIDE ROPES, SIGNAL CORD, LIGHTNING CONDUCTORS, &c.

One Shilling, at 117, Bishopsgate-street Within, London.

Original Correspondence.

REDUCTION OF MANGANESE.

Sir,—I wish to offer a remark or two on your article upon the influence of manganese on iron and steel, to direct attention to some leading points on this very indeterminate question. Of all the patent processes to which you refer, the results of Mr. Reynolds's process are the best known. He perseveringly attempted to produce from the blast-furnace an alloy of iron and manganese, but he was unable to obtain in the pig-iron the result he desired. His experiments seem to have been suggested by some foreign analyses, which represented some of the best Swedish marks of steel as containing as much as 8 per cent. of alloyed manganese. Subsequent investigation threw much doubt on the correctness of this opinion, and it has since been decided, as you have lately remarked, in consequence of the very best foreign steel being found to contain not a trace of manganese that it is impossible to assign the presence of that metal as essential in improving its quality. There, perhaps, was not a year, subsequent to Mr. Reynolds's patent, in which there was not some attempt made to use manganese as an improving agent in the manufacture of steel. All these were conducted on the impression that the improvement must be effected by alloying the manganese and iron. My father made a series of experiments with his usual care and accuracy, by reducing in an assay crucible mixtures of oxide of manganese and iron ore to produce such an alloy, but he could not accomplish it. The metal of manganese had never been obtained in any permanent available form. It appears from your last Journal that M. Brunner has found a means of producing the metal in a singularly permanent condition, but, as you remark, it differs much from previous descriptions, and requires to be further investigated.

Mr. Heath, in the course of experiments upon the action of manganese upon iron, undertaken on the popular impression that it was an improver, and the existence of which impression is a proof that some foundation must have existed for it, had his attention called to the development of manganese in a permanent metallic state, in the form of a carburet, which had been obtained precariously, and in very small quantities, by some of the foreign chemists. He conjectured that if he could find a means of manufacturing this carburet in quantity, he should then attain the desideratum of being able to alloy manganese with the "Wootz" steel, which was then the special object of his improvements. The difficulty of dealing with manganese, and producing any other result from attempts to reduce the oxide but an earthy manganese slag, led me, in a late Journal, to enquire respecting the new process indicated by "Sideros," in which the metallic manganese revived in a blast cupola was to be discharged into the contents of a vessel holding 20 tons of fluid pig-iron.

Mr. Heath succeeded in obtaining what he desired by a simple mechanical arrangement, and had it occurred to him to take a patent for the process of manufacturing carburet of manganese, it is possible he might have avoided the most discreditable litigation which ever brought contempt and odium upon our laws, and his subsequent death, under the judicial blunders of a minority of the judges.

The affinity of manganese for oxygen, and the affinity of the earths for oxide of manganese, were the Seylla and Charybdis through which he had to steer, and he succeeded by the simplest means. By mixing the oxide of manganese into small compact blocks with coal tar, he shielded the metal from the air by a carbonaceous envelope, which at the same time preserved the manganese from contact with the earthy matters of the crucible. This simple protection, the turning point of Heath's invention gave time for the oxide to be revived, and combine with sufficient carbon to preserve it, before the destructive agencies could come into play, and thus was carburet of manganese first produced in quantity with certainty. The infringement of his own patent, first originated by himself, was, as is well known, supplying the cakes of mixed oxide and coal tar to his agent at Sheffield, instead of the previously manufactured carburet. The requisite quantity of elements were found to metallise, and produce the same effect as the original carburet during the time the steel was melting, thus saving, at a great economy, a separate operation. This variation was finally determined not to belong to Mr. Heath nor to his patent—a decision which will be for ever a standing monument of disgrace to the intelligence and rectitude of perception of that minority of judicial functionaries which coincided in it.

But the result of Mr. Heath's researches did not by any means prove the theory under which he commenced; on the contrary, analyses did not detect a trace of manganese in his improved steel. He in consequence regarded the action of the manganese as simply detestive, removing by its powerful affinities certain oxides, or other substances injurious to the steel. But what these are, and the whole subject indeed, as you remark, is still beset by uncertainties, which may require a long course of honest, truthful investigation before much definite knowledge can be added to our store of useful information on the composition of so choice and costly a metal as cast-steel. There are very competent opinions that even silicon, in some proportion, gives more body to the steel, and it is certain some of the best steels are derived from highly silicated ores. DAVID MURPHY.

Jan. 12.

[ADVERTISEMENT.]

CAST-STEEL PATENTEES.

Sir,—That there may be no mistake as regards the bridge rail of east-steel exhibited at the Ebbw Vale Iron Company's offices in London last spring, I beg leave to state that it was manufactured from an ingot of steel which I made at the steel works here, under my patent process No. 9, and that the Ebbw Vale Iron Company were perfectly aware of this fact; and they knew equally well that the Uchatius process was in no way concerned in the production of the cast-steel ingot which I furnished them with, to be rolled into this bridge rail. If any parties cognizant of these facts have attempted to pass this rail upon the public as a cast-steel rail produced under the Uchatius patent, I can only say that these parties have shamelessly lent themselves to a double fraud, in depriving me of the merit due to my process under which I manufactured this steel; and, secondly, in bamboozling the public, by leading them to believe that the rail thus produced by my No. 9 process was manufactured under the Uchatius patent. From letters now in my possession, written by Mr. Thos. Brown, the managing partner of the Ebbw Vale Iron Company, and whose acts and deeds I may presume his partners sanction, I know beyond dispute that this rail, and no other, is the rail which was rolled from my ingot of steel, made under my No. 9 process. This No. 9 process is one of the number which your correspondent, "M. D.," states "were deemed of too little importance to justify the expenditure of hard cash to secure them." In other words, it was one of my valuable and practical processes, which Mr. Thos. Brown faithfully engaged should be patented, but which, between him and his faithful servants, Rixon, Son, and Anton, was kept back, stifled, and finally lost, by the shameful neglect of either the agents or their principal, or of both. When taxed with their breach of faith, these agents, in the most edifying manner, threw the blame upon their principal, attributing to him verbal instructions which gave the lie direct to his written promises to me, and alleged instructions given to them, in reference to this and other patents.

After this No. 9 process was thus suppressed, it may be supposed that Mr. Brown wrote to me, expressing his regret that such an injury should have been inflicted upon me. Far from it. He maintained an impenetrable silence upon the subject, and said that I reaped by a gentle remonstrance addressed to him, and a proposal to forego and forget past grievances, was an order to suspend operations, without even the usual notice which any gentleman would give to the humblest labourer, and to which even that labourer is entitled.

My brother has now apparently revealed the hidden machinery which has been in motion, with the view of annihilating as many of my processes as possible, and of casting discredit upon those which have escaped the "Patent Annihilator." If he be correct in his statement, and I have no reason to doubt it, it appears that though my patent process No. 9 was deemed of too little importance to justify the expenditure of hard cash to secure it, the bridge rail manufactured from an ingot of steel produced by that process was, nevertheless, deemed of sufficient importance to be paraded in public as the offspring of the Uchatius process; and the sensitive honour of the Atomics, which revolted at the idea of accepting my challenge to a trial of skill, as degrading to the cause of science, was nevertheless, sufficiently accommodating to allow them to wink at the bolstering up of their credit, inflated by the exhibition of this rail manufactured under my process. If the parties who are concerned in this matter have any regard for their characters as men of honour, they will at once come forward, and disclaim where they can, and explain where they cannot disclaim, the share they have had in these transactions. As any deception on the part of Sir C. Harkort is "impossible," he is bound, if he sees these remarks, for his own sake to state what he knows upon this subject, for to give a silent assent to deception is to practise deception. Mr. Robinson will, of course, come forward and clear himself, and that he may have no excuse, I have directed his attention to my brother's letter.

During the autumn of 1856 I was employed by Mr. Thomas Brown, as acting for himself and partners, to endeavour to perfect the Martineau or Bessemer process. I succeeded, and my patent No. 4 was in consequence taken out. Other processes were laid before the Ebbw Vale Iron Company, and amongst them the No. 9 process, by which this cast-steel bridge rail was produced, was taken up by Mr. Brown, and I hold his written pledge that it should be patented for England and for the Continent. I hold also his written assertions that he had directed Rixon, Son, and Anton to secure the provisional and the complete specifications of this process. The provisional specification was duly filed; but there the matter ended, and after the patent had become void, through the non-filing of the complete specification, I at last succeeded in wringing out of the faithful agents the information that Mr. Brown had, months before, told Mr. Howard, who had told them that they were to take no further steps in the matter of my patents. This Mr. Howard denied. But it further appeared that Mr.

Howard, a partner in the firm of Kneass and Co., the agents for the Uchatius patent, had been constituted agent for my patents; or, to use the language of Rixon, Son, and Anton, "had been entrusted with the charge of my foreign patents;" and that Mr. Luns had favoured Mr. Brown with his opinion upon the merits of this No. 9 process, thus doomed to be stifled and suppressed. Moreover, the Ebbw Vale Iron Company had purchased the Uchatius patent for 10,000*l.*, and my process would, if permitted to see the light, have completely set aside that process.

Under these circumstances, "somebody" seems to have conceived the following ingenious and right honourable course of proceeding. My patent processes, which superseded the Uchatius method, were suppressed, as of too little importance to justify the expenditure of hard cash to secure them; and this stroke of policy not only enabled the Ebbw Vale Company at once and for ever to deprive me of all prospect of emolument from this patent, which thus became void; but the process itself was disguised with the stigma of not being deemed worth securing by this great manufacturing firm—4*l.*, not worth 4*l.*. The 10,000*l.* purchase also was no longer jeopardised by the rivalry of my superior process. Perhaps a little honour was lost, *mais m'importe*, capitalists can afford it. The rail, however, the offspring of the rejected process, was a great fact, and as such was enlisted into the atomic service, and foisted upon an admiring public as "a rail of Uchatius steel," a "cast-steel bridge rail," a "bridge of fame over which the Atomics sneaked to gather the laurels which belonged to myself alone." The Potsdam heretic's quarters must be revisited, and we must have a bridge rail emblazoned on the baronial shield, with a regiment of Chevaliers d'indulgent ennemi, skulking over it, and with the further device of a jay in borrowed plumage, bearing in its beak a scroll with the "You cheat us" process engraven thereon.

The well-known position and reputation of the Ebbw Vale Iron Company places that firm above all the assemblages of disaffected parties, and of course they know nothing of these strange atomic doings: they have no time, no leisure, for subsidiary trifles. In his magisterial capacity alone, and placed between the cross fire of Mr. Mackworth and the Secretary of State, Brown is too much immersed in duty to be answerable for any pranks played by "somebody" with my patents and processes. Mr. Darby is lost in thought, and Mr. Robinson does the honours of the rail to Sir C. Harkort, to my brother, and to the brilliant galaxy of wealth and talent which throng the parlours of Laurence Pountney generally, and the Ebbw Vale Company office specially. He does more—he explains the nature of the process which gave birth to this "extraordinary production," and, in return for his courtesy, my brother freely gives him his opinion of the Brendon Hill deposit, which furnished the element of manufacture. Of course to have mentioned my name would have spoiled this pretty little game of hide and seek, or, more properly, blindman's buff, in which it is necessary that one person at least shall always be hoodwinked.

What interest could attach to a rail made by an obscure mortal in the "Silos Dacia," who knows as little of the world as the world seems to have known about this wonderful rail. But with a baron at the back of it, and a despotic monarch at the bank of the baron, and with the military Lens figuring, birch beam in hand, over the granulating wash-tub, the matter were a different aspect. It is grievous to have to demolish all these atomic enchantments; but the fact is, I sent my hammerman down to Ebbw Vale, with the veritable ingot, and which he there saw rolled into the veritable bridge rail, now claimed by the enthusiastic votaries of science, enlisted under the banners of the atomic process. There is a double-headed steel rail made by me under another of my patent processes, and which, after inspecting it here with Messrs. Darby, Brown, and Roden, I forwarded, at their request, to Mr. Barlow, Derby Railway Station, to be there laid down, and subjected to intense vetular trial, in order probably to test its atomic structure. Is this rail also claimed as an offspring at the shrine of Uchatius?—*Colfehol, Jan. 5.*

Ebbw Vale Ironworks, Christmas Day, 1856.—MY DEAR SIR: I am sorry you have not seen the hammerman, to report to you the first-rate rail-bridge, Brunel's patent, rolled from No. 12 ingot. The rail would have been 25 ft. long, but for the carelessness of the engineer, letting the engine stand when he had cut it to 16 ft. 6 in.—a first-rate rail. Your faithful friend, THOMAS BROWN.

[ADVERTISEMENT.]

THE IRON AND STEEL QUESTION.

Sir,—As I am not to be permitted to reply to your editorial remarks as a correspondent, I claim the insertion of the following reply as an advertisement. I am ready, willing, and able to make the good steel from coke iron, in the presence of any trustworthy chemist, and who may analyse the raw materials and the steel products, and have them tested on the spot by one of the ablest workmen in England. Send him here, and he will find I can keep my word; only, I stipulate that he shall not be a paid agent of the Ebbw Vale Iron Company. Those who lent themselves to the passing off of my cast-steel rail as a rail of "Uchatius steel" are not to be trusted twice. Dispute, if you please, the fact of my tough cast-steel containing sulphur and phosphorus; in doing so, you dispute not my word, but the word of Mr. S. H. Blackwell, who tested this tough cast-steel, and that of Mr. Henry, who analysed it at his request. In my father's earlier days, when he was a subordinate at a Scotch ironworks, his assay furnace was demolished by order of the enlightened manager, because my father had presumed to affirm that the same principle as light as coke could unite with as much sulphur of iron. Granting, then, that carburet of iron is formed on this principle, and really exists, it will, according to the laws of chemistry, assume one or more of the following forms:—

Biscarburet of iron—		Protocarburet of iron—	
Iron	69.58	Iron	82.07
Carbon	30.42	Carbon	17.93
Sesquicarburet of iron—		Diacarburet of iron—	
Iron	75.31	Iron	90.15
Carbon	24.69	Carbon	9.85
Tetracarburet of iron—			
Iron	94.82		
Carbon	5.18		

Now, able reasoner as you are upon assumptions, not facts, can you tell me which of these carburets of iron is pig-iron? Does pig-iron contain 9.85, 17.93, 24.69, or 30.42 per cent. of carbon? I believe not. Is, then, the forlorn hope, the tetracarburet of iron, pig-iron? Let us examine. I subjoin the analyses of 20 varieties of British coke pig-iron:—

Carbon per cent.		Carbon per cent.	
Aberdare white pig	2.42	Scotch pig, Eglinton	2.62
Gadley's white pig	2.19	Ditto, Glangarnock	2.50
Gadley's grey pig	2.80	Coalbrook Dale hot blast	2.30
Gadley's best pig	3.47	Darby Castle foundry	2.67
Gadford No. 3	2.70	Darby Castle forge	2.31
Victoria white	1.21	Darby Castle white	1.65
Ditto, improved quality	2.41	Russell's Hall	3.07
Ebbw Vale white pig	1.89	Bilston	2.05
Cwmbran common ditto	1.45	Heyford	1.55
Cwmbran Mine pig	2.37	Wellingborough	1.70
Average	2.3165	per cent.	

The average quantity of carbon combined and uncombined in these is 2.3165 per cent. Is this tetracarburet? Take refuge, if you please, in a polycarburet, as better chemists have done ere now; but this proves nothing. You never saw carburet of iron; you never formed it; you have never decomposed it; and chemical writers tell us its component proportions are not ascertainable. You cannot assign the weight of the carbon, upon the same principle that iron combined with sulphur is called sulphure of iron. Granting, then, that carburet of iron is formed on this principle, and really exists, it will, according to the laws of chemistry, assume one or more of the following chemical proportions constitutes the substance which is "well known" to chemists as carburet of manganese?

Biscarburet of manganese—		Protocarburet of manganese—	
Manganese	69.38	Manganese	81.91
Carbon	30.62	Carbon	18.09
Sesquicarburet of manganese—		Diacarburet of manganese—	
Manganese	75.11	Manganese	90.05
Carbon	24.89	Carbon	9.95
Tetracarburet of manganese—			
Manganese	94.77		
Carbon	5.23		

Define first the particular and definite proportions in which iron combines with carbon to form carburet of iron, before you make this rash assertion in reference to manganese. In what chemical work are you combining a ration of carbon and iron as carburet of manganese? And if these even are unknown, where shall we find the like compounds of manganese and carbon tabulated? Prove also, if you can, on chemical grounds, that the graphite of the blast furnace is not a definite compound of iron and carbon, and, therefore, true carburet of iron. If we admit, as we must, the truth and unerring simplicity of the atomic theory, we must dismiss the crude, untenable notion that pig-iron is carburet of iron. Is it any proof of the matter, that people have been accustomed to call pig-iron carburet of iron? Was the graphite of the blast furnace sulphur, because 60 years ago it was called sulphur? Show me first the chemical formula for carburets of iron established by experiment, and then you may discuss consistently the subject of what is "well known" to chemists as "carburet of manganese." Until very recently, one of our best chemists imagined that Heath's Patent was intended to comprise the use of "carbonate of manganese," not "carburet."

So well known is metallic manganese to chemists, and so well agreed are they upon its properties, that Dr. Ure informs us it is hard and brittle, with a specific gravity of 7.013, and falling into oxide powder by exposure to the air. But M. Brunner, who is a clever fellow, not shackled by bookworm dogmas, says it is like cast-iron, does not oxidize at ordinary temperatures, and has a specific gravity of 7.138 to 7.206.

As to the brittle compound, made by mixing a mixture of oxide of manganese and carbon, it possesses no resemblance to "spiegel Eisen," except in colour and hardness, and closely resembles the most ordinary slender pig-iron, only more brittle, and when it is alloyed with cast-steel the ingots formed are pervaded with honeycombs, and utterly unbound. As I have performed and recorded upwards of 10,000 experiments upon the subject of cast-steel, made on the scale of manufacture, I think I may safely cite my experience in opposition to your assertions. You have never seen an ingot made on the Bessemer plan free from both red-shortness and cold-shortness; show me any such, and I will give you weight for weight in gold. Where is the first proof chemist that collected the gas from the coils of a boiling Bessemer ingot; or whence did you draw the following *recherché* piece of chemistry?

"This gas is carbonic oxide, which seems to be dissolved by the melted metal, in the same way that oxygen is dissolved by melted silver." After this, why demur to my theory of the melted iron dissolving oxide of iron? If oxide of iron can be dissolved at a higher temperature than the cementing heat, why do ironmasters persist in building high furnaces, why not plunge the ores into the melting heat at once? Ironmasters can teach you a lesson here; it does not depend upon M. Mushet's imagination. The metallic substance you describe is no novelty to me. Oxygen and iron mix in all proportions, though there are certain definite compounds which do not vary in their component ratio.

You need not trouble yourself to show me that I am in a false position; the Ebbw Vale Iron Company have done that to your hands, and in a masterly manner. The rail of cast-steel made under my No. 9 process has been palmed upon my brother and the public as one of "Uchatius steel," and neither Mr. Brown, Mr. Robinson, nor

Mr. Darby, to all of whom I wrote respecting this "false position," have had the honour, the manliness, or the gentlemanly feeling, to free me from my "false position." You withdrew my recent manganese patent, and inform the public that metallic manganese cannot be reduced by means of flux and coke, and in your very next number you insert M. Brunner's plan of reducing it by this very method. Your correspondents banter me about metallic manganese, as if it were some evanescent substance, some vanishing fraction of an idea, yet Mr. Brunner finds it a real tangible metal, like cast-iron. "S. C." sends a lamp to your office, and says he can make it cheaply; and a friend of mine, an eminent chemist, the first man of his year at Cambridge as metallist, tells me he can make it, and will send me some in pigs. You would make the arts subservient to chemical analysis, and condemn my steel because it does not come up to the standard by which literary men judge of such matters. It may cut cast-iron, it may bore a hard rock, it may roll into draught boiler and tin-plates; but this is not enough—it contains phosphorus and sulphur, and must, therefore, be discarded. I shall make but one more observation. You say that the manganese in "spiegel Eisen" is in the state of "carburet of manganese." Prove this bold assertion, the hardness of which eclipses even mine, and your point is gained. Alloys, then, cast-iron and copper, and prove that the copper exists therein as carburet of copper. You will find the latter the easier task.

I have made known the observations and experiments which have proved and established the truth and soundness of my processes, and not all your criticism, nor all the crushing influences for evil of the unscrupulous men whose policy it is to blight my prospects, can alter these facts. Come and see it done; and if you decline this invitation, cease to carp at what you will not understand. ROBERT MURPHY.

Colfehol, Jan. 11.

WILL SMOKE PREVENTION SAVE FUEL?

Sir,—I am frequently asked—Will smoke prevention save fuel? and as often my reply is—Certainly, if the appliances are based on scientific principles, and are correctly adapted to the required process of combustion; but that the proper means must naturally vary with local circumstances, or peculiarity of furnace-work. That such proper means will increase the average pressure of steam for marine and other purposes—the true equivalent for economy of fuel, where the regular consumption of coal cannot be ascertained—I have, with your permission, repeatedly shown in your Journal; and occasionally I have offered evidence of the fact that the expenditure of fuel has been reduced in cases wherein accurate comparison could be instituted. I have now, however, opportunity of proving the affirmative to the question in a manner that ought to satisfy the most sceptical.

This will be convincingly apparent to your readers, if you will obligingly give insertion to what I now write, with the appended certificate. I beg only to add that Mr. Bowman, the very able engineer to the Victoria Dock, obtains a daily record of the number of strokes made by the engines, taken from accurate registering counters affixed to them, and is also as correctly informed of the quantity of coal supplied from time to time to the boiler-room. The amount of saving, therefore, has been computed upon the duty actually performed by the engines, and the fuel consumed in giving them steam, during three months before and three months after the fitting of my regulating air-doors to the furnaces. And further, that until I met the Manager and Engineer at the docks, on Tuesday last, I was unconscious of the importance of economy of coal that had been so satisfactorily ascertained, although I was previously aware of the suppression of smoke, and of the greater facility that existed in getting up and keeping steam.—*Mah-street-Hill, Jan. 15.* J. LEE STEVENS.

Victoria (London) Docks, Jan. 12.—Sir: In reply to your application as to the efficiency of your patent regulating air-doors, for smoke prevention, I beg to say we have found them answer the purpose admirably. Aided to which, we find from their application a saving of 15 per cent. in fuel.—C. CAPFAR, Manager.

MINERAL VEINS IN THE PRIMARY CLAY-SLATE.

Sir,—The opinion of your correspondent, in the Journal of Dec. 26, upon this subject is certainly rational, and will, no doubt, be borne out by most practical miners, whilst few would fall in with the doctrine that clay-slate or killas is a secondary formation. It has been proved to hold down to a depth of 400 fms., with but little if any change in appearance or hardness from 20 fms. downward. Geologists contend that these rocks were once held in solution, and have settled in the way now found, consequently the formation is called a stratum, instead of a rock. Perhaps I may interrogate the geologists a little respecting some particular changes in the rock that I witnessed in a shaft sunk 60 fms. from surface, near the foot of the Caradon granite hill. We commenced an engine-shaft, and passed through, first a soft white killas, such as I have seen rich copper lodes traversing in other mines, at a very deep level; then a hard red rock, very troublesome to excavate. Here (being about 20 fms. deep) we met with a light blue killas, which continued to nearly 30 fathoms below surface. We then experienced two changes, almost together; for 2 fms. there was a soft white killas, some of which could be taken up with the shovel alone, and we then came upon what in this country we call the ironstone, which is as hard as flint. Fortunately, however, a lode made its appearance, crossing the shaft lengthwise, and, although soft, made its way through the hard stone, and assisted the sinking of the shaft 3 fms. of this, and met with white killas; 3 fms. of this brought us upon a range of granite, which lasted 2 fms., and we were then again for 2 fms. in soft killas, when we came upon the granite. If all these ingredients were at any time held in solution, why did not the weightiest matters settle under the lighter substances? If any friend will explain this to my satisfaction, I will believe in the doctrine of secondary formations; but until then I shall consider the idea absurd and groundless.

I cannot unite with "Inquirer's" views respecting the formation of mineral veins or lodes, as during an experience of 40 years I have seen nothing to justify the opinion that a force-agency has been at work. On the contrary, the matter compelling lodes is so various, that no practical person would suppose the minerals to have been placed there by any such agency. In a few fathoms driving the character of the lode varies considerably, a good lode changing, by becoming spar, capel, mundle, &c., spotted only with ore. Again, it is not unfrequently the case that we meet with large hollows in a lode, called vugs—sometimes in a fine course of ore, sometimes where there is none. I ask, if there be an agency at work forcing the mineral into the lodes, and the mineral be held in solution, how is it that these hollows are not filled up? Again, if there be ore in production, but if they expand beyond the limits of a lode, filled with copper ore and another lode, or hard clay, or soft spar, or follows by the side of the lode? Sometimes we drive on a lode for several fathoms, and the ore comes out like cinders; then it becomes rocky, and the stones are fixed as if by a mason. In breaking this sort of lode, one stone is sometimes all copper and the next only copper combined with mundle, capel, spar, peach, &c. Not unfrequently, in breaking a stone of spar we find copper in the middle.

I have worked in lodes where, if the walls are within a certain distance of each other, a good deal of ore is produced, but if they expand beyond the limits of a lode, made its way into the greater space as well as the smaller! I have noticed in other places a lode which has been rich in hard, and what is called uncongenial ground; and as soon as it touched or got into soft ground it became very poor, sometimes even good for nothing. If the received doctrine be correct, we might expect to find lodes invariably the richest in soft ground. In others I have noticed the lode rich and large for some fathoms, suddenly become small but good, and after driving or sinking a few feet open again—these changes taking place in one kind of rock. I could name a hundred instances which prove that a force-agency cannot have been at work in forming the mineral veins.—*Lostwithiel, Jan. 7.* JOHN SEYMOUR.

MANAGEMENT OF SLATE QUARRIES.

Sir,—To a practical quarryman some portion of Mr. Richard Thomas's letter, published in your last Journal, would appear to be somewhat derogatory to the character of that valuable class of gentlemen called "quarry agents," who are generally, in reality, experienced and skilful managers. I am quite aware that now able persons have occasionally been employed as quarry managers, but they form the exception, not the rule. If Mr. Thomas be understood to say that such persons are "makers" and "shoemakers" be employed by "speculative individuals" to carry out their own views, there may be much truth in his statement; and the absurd notion to which they were subjected might have been appropriate enough for such barefaced impudence; though, had I to ascertain their qualification, I could have exacted a more certain criterion of their skill. I feel confident that if any of the honourable quarry agents in North Wales had been required to split a block and make a slate, as the ultimatum of their skill and understanding, and they had considered it both an offence to their requirements, and a certain loss of their employer's ignorance. In well regulated slate quarries there are a class of men called trimmers, slate makers, and these do nothing else, and consequently know little or nothing of the most important and practical development of the quarry, just as you may find ore-dressers, on many a well-regulated mine, who may, perhaps, never have holed a single foot into the original bed from which they throw their dazzling silver cubes into the bin. Neither of these I submit would be a proper person to manage the works. I am quite prepared to admit that a person who has regularly passed through the various departments of a quarry, from the humblest labourer to the position of mine captain, and who has done his duty equally so with the bumble-bee, who may have worked his way to the honourable position of mine captain; and these gentlemen ought to be, and generally are, selected to manage the working department of Welsh quarries. It is, however, to be deplored that, by reason of early and continual application to their duties, many of these have had denied to them one great advantage—that of proper education, and they do not, therefore, as an invariable rule, form the best class for the higher offices in such establishments, though possessing, as they generally do, the strictest integrity, good skill, judgment, and intelligence.

I shall be glad to see Mr. Thomas's proposed communication "as to how and where the best slate quarries are to be obtained," and I hope he will accompany such by some useful and practical information; and I feel assured, Mr. Editor, that with your usual zeal and consideration for the mining interest, afford a corner in your valuable Journal for the occasional insertion of really useful correspondence upon a subject so important and interesting as the—

Dolgelly, Jan. 12.

LEGITIMATE MINING.

Sir,—A great deal has been said, *pro* and *con*, on this subject. Now, as I know something about the construction of a certain company (mind, I have no interest whatever in the matter), I appeal to even "Fides" if this mine come not within the category of legitimate mines. I do so the more readily, as I perceive there still lingers a depraved pandering to the public taste, when pages usually devoted to works of higher merit are devoted to ridicule, caricature, and debasing the Cornish miner, because a few people have been deceived by parties pretending to that title.

The mine to which I allude was a part of the late W.—I United Mines, which started under unusually promising auspices, some year or two since. By banishing him from their counsel who understood the business, and by trusting to men who did not the mine got—where all mines must under similar circumstances—into disrepute and difficulty. Distrust was engendered, and a sale of effects took place as *seignior*. So satisfied, however, were parties resident in the neighbourhood of the genuineness and worth of the undertaking, that ten of them stocked a capital of 50*l.* each to recommence the working of this part of the mine, this sum being sufficient to erect water-power equal to pump out the mine, and expose the lode thus prematurely abandoned, said to be worth 12*l.* per fm. The late company would neither reason or look at facts, or this could never have been abandoned. However, the fact will soon be tested. The captain will certainly be exposed in your pages, and be shunned by his friends, if such be not the case as he has stated, and which a few months at farthest will prove.

The 500*l.* subscribed is to test the mine, when, if it be equal to anticipations, the company will be thrown open to the public, in 3000 shares, at 1*l.* each; the money

Equal to repayment of the entire cost of doors and patent right in four months.

so raised to reimburse the present adventurers their outlay and costs, and no more. The surplus to be applied to the further extension and development of the mine, the accounts of the mine and vouchers for receipts to be the test of outlay. When the extended company is formed, the proprietors are to select their own officers and control the management.

Now, Sir, if this be not legitimate, I confess I do not know what it is. It is really disgusting to hear and see so much twaddle about mines and miners, by people who know nothing about them; who, because they have been silly enough to part with their cash to a "bal seller," or a knavish broker, suppose all men are alike. Let them come amongst them and see for themselves, and they, like others, will alter their opinion, for though there be plundering "bal sellers" and silly dupes, there are honourable, noble men amongst them, whose presence would decorate the Alhambra of British talent, and before which their calumnies would quail.

Germes, Jan. 9.

RECKLESSNESS OF MINERS—UNFENCED SHAFTS.

Sir,—"All our praises why should lords engross?" sings one of our sweetest and most elegant poets—"All our censures why should slow engross?" sing we. Are the unskilled and unwashed the only parties who are reckless of human life? Are not those who reap the benefit of their labours sometimes equally culpable? We fear they are too frequently, not, perhaps, like the poor miner, heedless of his own safety, but careless of that of others.

My attention was drawn to this subject most forcibly a few days since by observing an old shaft at Carbis Valley raised off, to prevent accidents. This shaft had remained for many years without any protection whatever, though 18 or 20 fms. deep, and only a few yards from a footpath. On enquiry, I was informed that the mine was resumed, and the first requisition of the lord's steward was that the shaft should be secured, or any cattle or low the tenants might sustain would be charged to the mine adventurers: so here was protection indeed! The shaft, as long as it was in the hands of the lord, might be as dangerous as ever, so that he was spared the cost of protection, and the tenant might whistle jigs to milestones for his cattle's safety; but no sooner had the poor miner taken possession of his set, than he was at once obliged to do what common humanity and self-interest ought to have dictated the lord of the soil long since to have done, or to have seen that the former workers had done.

I have frequently observed the same gross carelessness in many parts of Cornwall, where yawning abysses are left exposed, without the slightest protection, and close to the public footpath, and even the public highway. At Porthkella Moor are streamers' hatches, 30 feet deep, not six feet from the highway. On a dark night these places are highly dangerous, even to a resident, and positively so to a stranger. This, too, is on the property of the Duke of Cornwall, who surely cannot be aware of the state such property is in.

Now, Sir, in all the mining leases with which I have been concerned (and they are not a few), certain clauses to the effect that, on abandoning the mine, all shafts shall be secured, or filled in, or otherwise properly secured; and I opine that, on any accident occurring in a shaft of an old mine, the landlord is clearly liable to an action for the recovery of any loss that may be sustained, as it is his duty to see that these protections are kept in a proper state. This, however, is sadly neglected by these gentlemen and their stewards.

That accidents do occur sometimes is well known. About a year ago, near Chacewater, a boy fell into an unprotected shaft, and was killed. A most painful occurrence, arising from this carelessness, came under my notice a few years since: a Mr. W., a resident of Penzance, went out shooting on one of the wild downs, accompanied by his dog only. On examining an old brake of farns, he attempted to tread out a hare or rabbit, when he found the farns gave way under him, and his feet went through. He spread out his arms convulsively as the conviction came upon him that he was suspended over a shaft. To his horror, he touched the wall of the shaft, and displaced a stone, which fell thump, thump, against its sides in its descent, and at length plunged into the water, at, as he calculated and afterwards measured, 50 fms. deep. He felt he really was in an awful position: the farns prevented his approaching the edge of the shaft, and he was unable to get up. After commending his soul to God, he remained in the position for one hour, shouting in the hope that some stray passenger might go by, but none came. He then found his strength fast failing, and his body gradually sinking through the farns; and he determined, therefore, to make a desperate effort for life. After gradually working one toe into the wall of the shaft (a soft growan), he made a spring, and succeeded in catching hold of a small shrub of heather, which was growing near the spot, and by its aid succeeded in gradually and carefully extricating himself from his perilous situation. His first act was to return thanks for his delivery: his next to utter shrieks of terror his previous excitement had suppressed. Such a terrible effect had the fright on him, that the next day his hair, previously almost black, became perfectly white, and he ever afterwards was the victim of nervous debility.

That accidents do not more frequently occur is truly surprising, but that is no reason why such places should not be secured. In the hope that this letter may call attention to the subject, I beg you, Mr. Editor, to allow its insertion, as I assure you it is a great and acknowledged evil.

H. G.

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H. G.

PROGRESS OF BRITISH MINING, FOR THE QUARTER AND THE YEAR ENDING DECEMBER 31, 1857.

BY J. H. MURCHISON, ESQ., F.R.S., F.G.S., &c.,
Author of "British Mines Considered as a Means of Investment."

The writer has, in his Quarterly Reviews, endeavoured to keep his readers acquainted with the progress of British Mining, and to afford such information as might be useful to those who are interested, and who may be disposed to embark, in this class of investment. But at the present season a reviewer is expected to enter more fully into his subject, taking a more extensive survey of the past, and attempting a few suggestions as to the probabilities of the coming year.

At the end of 1856, the writer drew attention to the continued prosperity of this branch of national industry, as proved by the large increase in the dividends paid. The amount paid by British and Irish Mines in 1855 was the largest in any year up to that time, but 1856 exceeded 1855 by 61,428l., while the dividends of English mines alone exceeded those of 1855 by 46,839l. The first quarter of 1857 showed the dividends to be still increasing, and at the end of June last they amounted to 261,047l., of which 224,842l. was paid by English mines, being larger than the sum divided in any one year up to 1851, inclusive. At the end of Sept. the results were of a similar character, showing a considerable increase over the first nine months of 1856. In Oct. the prices of copper and tin began to fall, and have receded to such a point as greatly to affect the returns of the mines producing these metals. It is needless to remark that this reaction has been mainly caused by the recent violent convulsion in the commercial world, and the panic in the money market, which have paralysed for a time the trade of the country. Some of the principal mines have also kept back their usual supplies, which has tended further to diminish the profits. In the past quarter the sum of 91,085l. has been divided by British and Irish mines, being a decrease of 11,339l. under 1856, while for the whole year the amount is 467,122l., an increase of 17,958l. over 1856.

At the beginning of January copper ore of 7½ per cent. produce fetched 8l. 3s. 6d. per ton, or 22s. 6½d. per unit of the produce, and the price gradually rose till January 29, when 6½ per cent. fetched 7l. 10s. 6d. per ton, or 23s. 11½d. per unit, the highest price of the year. The price then fell by degrees till June 18, when 6½ per cent. ore realised 4l. 17s. 6d., or 16s. 11½d. per unit, being a fall of 7s. per unit, equal to a fall of 42s. per ton on ore of 6 per cent. produce. The price then rose a little, and on July 2 ore of 6½ fetched 5l. 17s. per ton, or 17s. 7½d. per unit. But on Jan. 8 ore of the same produce fetched 7l. 12s., or 22s. 11½d. per unit, the fall in the six months being equal to 35s. per ton of ore. On Sept. 10 the price had again risen to 6l. 17s. per ton for 6½ per cent. ore, being 21s. 0½d. per unit; but it then fell, and the following will show to what extent since Oct. 1:—

Date.	Produce.	Price per ton.	Price per unit.
Oct. 1	6½	5 17 6	16 11 ½
" 8	6½	5 13 0	15 9 0
" 22	6½	5 13 0	15 9 0
" 29	6½	5 14 0	15 10 0
Nov. 5	6½	5 12 0	15 8 0
" 12	6½	4 17 6	15 11 ½
" 19	6½	4 17 6	15 11 ½
" 26	6½	5 4 0	16 13 ½
Dec. 3	6½	5 8 0	16 17 ½
" 10	6½	5 10 0	16 21 ½
" 17	6½	5 4 0	16 0 0
" 24	6½	5 10 0	16 21 ½

The lowest price of the year was on Nov. 12 and 19, namely, 15s. 11½d. per unit, and compared with the highest price, namely, 23s. 11½d. on Jan. 29, it shows a difference of 8s. 0½d. per unit, or equal to 48s. 1½d. per ton on 6 per cent. ore.

The average price per unit in 1857 is 19s. 8d., and in 1856 it was 18s. 4½d. At the beginning of the year the price of lake copper was 126l. per ton, which was raised to 135l. in the middle of Jan. In April it was lowered to 126l. again, and at the end of May to 117l.; on Aug. 26 it was raised to 121l. 10s., and on Dec. 8 lowered to 107l. 10s., at which it remains. The following are the particulars of the sales of copper ores in Cornwall:—

Quarter ending—	Tons.	Av. prod.	Amount.	Av. price.	Fine cop.
1857—Dec. 25	45,395	6.390	232,517 4 6	5 11 3	2899 19
Sept. 30	45,676	6.416	237,782 3 6	6 0 0	2941 11
June 30	50,972	6.258	311,847 2 6	6 2 4	3188 17
Mar. 31	49,755	6.334	349,124 12 6	7 0 4	3152 17
1856—Dec. 25	48,334	6.827	316,599 1 0	6 11 0	3287 6
Sept. 30	49,636	6.976	329,223 16 0	6 7 0	3445 18
June 30	54,373	6.311	308,633 18 0	5 13 8	3437 13
Mar. 31	53,934	6.202	317,337 17 6	5 17 8	3318 9

These figures show that the quantity of ore has decreased 281 tons under the previous quarter, and 2939 tons under the corresponding quarter of 1856; the produce has decreased 026 under the previous quarter, and 437 under 1856; the amount has decreased 35,266l. 1s. under the previous quarter, and 64,081l. 16s. 6d. under 1856; the price per ton has decreased 14s. 9d. under the previous quarter, and 19s. 9d. under 1856, and the fine copper has decreased 41 tons 12 cwt. under the previous quarter, and

387 tons 7 cwt. under 1856. The following are the totals and averages for 1857 and 1856 respectively:—

	Tons.	Av. prod.	Amount.	Av. price p. ton.	Fine cop.
1857	191,798	6.343	£1,301,271 5 0	£6 5 3	12,183 14
1856	206,177	6.563	1,241,531 12 6	6 0 5	13,229 6

The general results, therefore, show a considerable falling off in the supply of copper from the mines of Cornwall and Devon in 1857, compared with 1856, the difference being 1346 tons, of the value of about 150,000l.; while the quantity in 1857 is also less than in 1856 by 395 tons, of the value of about 43,000l. The average price paid for the ores is higher in 1857 than in 1856, though the average produce per cent. is lower.

Notwithstanding these facts, the exports of British and Irish copper have increased, as the following figures from the Board of Trade returns to the end of Nov. show:—

COPPER—QUANTITIES EXPORTED.					
	Month ending Nov. 30.	Eleven months ending Nov. 30.	1856.	1857.	1857.
Unwrought	8,340	8,979	13,426	92,790	107,906
Sheets and nails	37,540	39,394	19,228	183,390	364,061
Wrought, &c.	2,317	2,003	7,446	19,499	27,297
Totals	48,197	50,346	39,900	315,679	399,264

The foreign imports and exports have been as follows:—

	Month ending Nov. 30.	Eleven months ending Nov. 30.	1856.	1857.	1857.
Copper ore and re-	1855.	1856.	1857.	1855.	1857.
gulus	3,337	5,908	9,069	54,027	67,945
Unwrought, &c.	9,922	468	8,340	118,639	65,758
Totals	13,259	6,376	17,409	172,666	133,703

The deductions to be drawn from the above figures are these:—the produce of British and Irish copper has diminished, while the exports of the same have considerably increased; and the importations from abroad have increased, while the exports of foreign copper are also larger.

There does not appear, therefore, to be any indications of an overstocked market for this metal, except what may be temporarily caused by the derangement of trade through the late monetary and commercial panic.

For the first nine months of the past year lead maintained a good and steady price, but in the past quarter it has not escaped the general depreciation, and is now 2½ to 3½ per ton lower. The following are the exports of British and Irish lead:—

LEAD—QUANTITIES EXPORTED.					
	Month ending Nov. 30.	Eleven months ending Nov. 30.	1856.	1857.	1857.
Pigs, &c.	1,330	1,678	908	21,091	21,554
Ore, &c.	342	501	286	5,151	5,373
Totals	1,672	2,179	1,194	26,242	26,927

Tin was at a high price during 1856 and the early part of 1857, but just before the Banco sales, at the beginning of last summer, it was lowered; it subsequently rallied, and three months ago block tin was at 140l. per ton. In the past three months the price of this metal has had a rapid and severe fall, being now quoted 108l., or 14l. per ton less than the average of the last five years.

BRITISH AND IRISH TIN EXPORTED.

	Month ending Nov. 30.	Eleven months ending Nov. 30.	1856.	1857.	1857.
Unwrought	1,071	2,782	2,965	24,636	33,633
Plates	75,368	136,360	58,592	1,034,236	1,294,653
Blocks, &c.	288	6,616	11,088	25,609	53,824
Totals	77,427	145,758	70,553	1,084,481	1,382,110

In 1856 the total amount divided by British and Irish mines was 449,164l., while the accompanying table shows that the sum divided in 1857 is 467,122l., being an increase of 17,958l. in the latter year. These amounts may be thus classified:—

	English.	Welsh.	Irish.	Isle of Man.	Totals.
1857	238,403	235,075	229,125	219,530	942,133
1856	357,349	29,585	18,400	18,500	405,834
Increase in 1857	82,663	204,910	210,655	201,030	519,258
Decrease in 1857	—	—	—	—	280

The following analysis will show the relative amounts paid by mines of the different kinds of metals:—

	Copper.	Cop. & tin.	Lead.	Tin.	Totals.
1857	230,323	244,588	234,674	237,537	947,122
1856	323,572	14,997	79,901	30,304	448,774
Increase in 1857	86,751	229,591	154,773	207,233	478,348
Decrease in 1857	—	—	—	—	280

There is, therefore, a considerable decrease in the dividends paid by copper mines, and an increase on all the others. In 1856 the results were something similar, but the falling off on copper mines was then almost nominal.

In the Review at the end of 1856, the writer named twelve progressive mines, which he considered would be among the first that would enter the Dividend List, and of these four have already realised his expectations, and, but for the serious fall in the prices of copper and tin, it is more than probable that two or three of the others would have also done so by this time. A moderate rise in the metals may be anticipated before long, and looking at the reduction in wages generally taking place in the mining districts, and the fall in the prices of some of the principal articles consumed in mines, such as powder (gone down lately 16l. per ton), iron, timber, &c., the total dividends paid will likely be maintained in 1858. It is not likely that tin will rise to such a price as it was about three months ago, but perhaps an advance of 6l. or 7l. per ton in the spring may take place.

During the past year the following mines have entered the Dividend List for the first time—Collacombe, Calstock Consols, East Falmouth, Grambler and St. Aubyn, Great South Tolgus, St. Day United, Wendron Consols, Wheal Grylls, and Wheal Jane; and the following have resumed dividends after a temporary suspension—Carn Brea, Herodasfoot, South Tolgus, and West Caradon. The principal concerns which have increased their dividends, are Devon Great Consols, by 9216l.; Eyan, 5600l.; Minera, 8025l.; Par Consols, 8320l.; and West Seton, 4800l.

During the year (particularly in the last few months), there has been a great fall in many of the high-priced shares—such as East Pool, from 35l. to 150l.; Grambler, from 117l. to 80l.; North Wheal Bassett, from 35l. to 12l.; South Wheal Frances, from 360l. to 220l.; Wheal Bassett, from 270l. to 140l.; West Bassett, from 32l. to 22l.; Duke of Cornwall, from 18l. to 3l. 15s.; Great Wheal Alfred, from 15l. to 4l. 10l.; Treveltha, from 3l. 10s. to 16s.; West Providence, from 14l. to 5l.; Margery, from 17l. to 7l.; Rosewarne, 45l. to 20l.; and Wheal Clifford from 550l. to 250l., &c. On the other hand, East Bassett has risen from 35l. to 95l.; Owm Erfin from 25s. to 6l.; Nantoes and Penrhwi from 10s. to 30s.; Penhaldarva from 20l. to 30l.; East Alfred from 1l. to 2l.; Treveltha from 3l. 10s. to 10l.; West Par from 5s. to 12s. 6d.; East Wheal Russell from 5s. to 3l.; Eyan from 25l. to 68l., &c.

The present extreme flatness of the share market renders it a very favourable opportunity for intending investors, who should turn their attention to those mines which have been developed to a considerable extent, which are making returns, and which there is every reasonable probability will soon be making profits. By making a judicious selection of such mines, there are the best chances that the capital invested will ultimately be greatly increased, in addition to dividends received. When mines begin to make good profits, the shares rise to high premiums, and at these prices they are often quite as speculative as any others.

Generally speaking, lead mines are the cheapest to work and quickest to make returns. In 1856 there was a fall in the price of lead, and yet the mines of that metal paid about 75 per cent. of the total increase of dividends in that year over 1855; and again, in 1857, there is an increase over 1856. Cardiganshire has been noted for centuries for its rich lead mines, which have made immense returns and profits. In the past year, it will be seen that Welsh mines divided 15,075l., or about 40 per cent. of the dividends paid by all the lead mines of the United Kingdom. Of this amount the Cardiganshire mines alone paid 16,550l. A very few years ago there was almost insuperable prejudice against Cornish mines, but

This includes 10,000l. divided by the Miners' Mines, omitted in previous Reviews.

this has been overcome: more attention has been given to them; they have become more judiciously, economically, and respectfully managed; more capital has been introduced for their development, and the consequences have been that in about eight years the profits have nearly doubled, and they have become a more popular investment. The writer is of opinion that results of a somewhat similar nature will arise from the attraction which Welsh mines are now gaining, and that year by year will witness a successive increase in the importance which the mining undertakings there will attain.

Recent exposures with respect to some public companies naturally draw attention to the nature of the constitution of mining undertakings. Most of the mines in Cornwall and Devon are conducted on the Cost-book System, which, if legitimately carried out, affords the most ample opportunities for shareholders making themselves acquainted with their true position and prospects. Generally there are meetings every two or three months, when a financial statement, and a report of the mine, are laid before the shareholders, and dividends are declared and calls made, as the case may allow or require. It is impossible, without the knowledge of the shareholders, to pay a dividend, except out of profits, the actual costs and returns being balanced against each other. Where necessary, calls are made to meet the expenditure until the following meeting; while a person is liable only for the debts incurred during the time he has been a registered shareholder.

Since the passing of the Joint-Stock Act, 1856, some companies, particularly those engaged in working mines beyond the counties of Cornwall and Devon, have come under its provisions, taking advantage of limited liability. Indeed, such a step would appear to be absolutely necessary, according to the opinion of many eminent lawyers. The late Mr. Duncan, in his published comments on the Act referred to, remarks:—

Practically, the Act abolishes all cost-book partnerships, except those "engaged in working mines within, and subject to, the jurisdiction of the Stannaries." That jurisdiction is confined to mines in the counties of Cornwall and Devon. Companies may continue to be formed to work mines in other counties, or even abroad, and may profess to be subject to the rules and regulations of the cost-book; but it will be a delusion to the shareholders of such companies to think that they will have the protection which the Cost-book Principle, within the jurisdiction of the Stannaries, now gives, and will continue to give, to adventurers or shareholders in the mines subject to that jurisdiction. Such companies, out of that jurisdiction, must be formed and registered under the new Act, in order to obtain limited liability; and if not so formed and registered, but professing to be established on the Cost-book Principle, each and every shareholder in them, whatever may be the self-constituted rules and regulations to the contrary, will be "severally liable to the payment of the whole debts of the partnership, and may be sued for the same, without joining to the action or suit any other members of the partnership." Let not adventurers in mines be deluded on this subject. There are some parties extraordinary sticklers for the Cost-book Principle; they will be unwilling to admit that this is the result of the legislation under the new Act, as regards mining partnerships, but it is vain so to contend. The language of the 4th section puts the matter beyond doubt. But in this there is no cause for embarrassment, for all sensible persons, however wedded to the Cost-book System, must prefer a company to work mines being formed with distinct and certain "limited liability," under the new Act, to its being established upon the Cost-book Principle, even if, out of the jurisdiction of the Stannaries, that principle possessed force and legal effect, which now it no longer possesses.

A shareholder in a cost-book mine, within the jurisdiction of the Stannaries Court (in the counties of Cornwall and Devon), can be sued individually by any or all the creditors of the company, for any or all the liabilities; but he can then recover all beyond his proportion from his co-adventurers. The great object of every cost-book company should be to have its calls punctually paid up, so as never to have any liabilities of consequence; and shareholders should particularly attend to this, or they may suffer from its neglect. Mining companies are something of the nature of private partnerships, every partner having the fullest access to the books at all times, and no one dare to question such a right, so that there is no impediment to those interested carrying out such a suggestion. It would appear, however, that in companies now carried on under the Cost-book System, without the jurisdiction of the Stannaries (that is, out of Cornwall and Devon), every individual shareholder is personally liable for the "whole debts of the partnership," and it is doubtful whether he is able to recover any portion from his partners. This is the penalty for not coming under the new Act.

My friend, Mr. J. Y. Watson, F.G.S., in his able and elaborate paper on the Progress of Mining in 1857, published in the *Mining Journal* of Jan. 2, 1858, refers to a common remark among capitalists, that they would gladly invest 500l. or 1000l. in a mine, if they could ensure not being called upon for more, and that they, therefore, advocate a large subscribed capital. Mr. Watson objects to this, because, he says, it "would do away with the Cost-book System, which renders mines exempt from the Joint-Stock Act;" and he adds, "The Cost-book System allows money to be provided only as it is required, generally two-monthly; and although every shareholder is individually liable for debts so incurred, he can at any time rid himself of responsibility, by paying up his proportion of debts, and relinquishing his shares." It is true that the old Joint-Stock Act exempted cost-book companies generally, but we have seen that the Act of 1856 (which repealed the former one) exempts only those who, in the words of the 4th clause, "are engaged in the working mines within, and subject to, the jurisdiction of the Stannaries," the penalty for non-compliance being that, "if any persons carry on business in partnership, contrary to this provision, every person so acting shall be severally liable for the payment of the whole debts of the partnership, and may be sued for the same, without the joinder in the action or suit of any other members of the partnership."

Again, this Act also "allows money to be provided as it is required," which is the usual plan adopted, the shares being limited to a fixed amount, which is called up as the money is wanted, the whole, perhaps, never being asked for. The meetings can also be held as often as under the Cost-book System. But the important features are, that no one is liable for more than he subscribes for—that is, for the sum not called up on his shares, and he cannot be sued by a creditor for any liability. Neither of these advantages are possessed under the Cost-book System; for although a shareholder may recover from his co-adventurers their proportions, this entails great annoyance, trouble, and expense, which would almost frighten many persons from attempting it at all, but rather put up with paying the full claim; and it may so happen that few, if any, of his partners are able to pay, and in that case he has no alternative. It may further be remarked (and it will be seen from what has been said), that by "paying up his proportion of debts, and relinquishing his shares," a person does not necessarily "rid himself of responsibility," for he must also see that all debts incurred while he was a shareholder have been paid. Such things have happened as persons being called upon to pay claims even years after they have sold their shares or relinquished.

There is no doubt but that the Cost-book System is advantageous where strictly carried out, and it is the best plan where a few responsible persons, well known to each other, wish to join in working a mine, in which cases, indeed, it was chiefly, if not entirely, applied till within a comparatively recent period. But the shareholders in mines are now resident much further from each other than they used to be, and it is impossible for a large proportion to look personally into the affairs. The new Act gives them many privileges and advantages, and protects the interest of all by the most stringent provisions. It has even been said that, in this respect, the Act is too strict, for under it shareholders have even more powers than under the Cost-book System.

When a company is started with limited liability, it is very easy for the parties to agree to spend a certain sum (such an amount as may be then thought sufficient), and if requisite or desirable, they can raise further capital at any subsequent time. Everyone thus knows his position, and pays his calls more cheerfully; while creditors look to the respectability of the company before they trust it.

Mr. Murchison then gives, at great length, an account of the principal dividend and progressive mines, from which we extract the following:—

ALPRED CONSOLS.—Judging from the frequent and great fluctuations in the shares, this mine would appear to be a very speculative one,

present end is poor. The 40 west has been good for a long distance, yielding 1, 2, and 3 tons per fm. The lode in the present end is worth 1 ton per fm., and promising speedy improvement. In the past year 1868 tons of copper ore have been sold for 11,834 1/2s., against 1570 tons for 9140 1/2s. 6d. in 1856. The mine entered the dividend list, for the first time, in 1857, and paid 4500s., or 45s. per 1000th. The samplings in future will be two-monthly, and the reserves in and throughout the mine are sufficient to keep up the present returns of 130 to 150 tons per month, giving a fair profit.

DEVON GREAT CONSOLS.—In the past year 25,746 tons of copper ore were sold for 146,516 1/2s. 1d. against 23,425 tons for 155,871 1/2s. 6d. in 1856. In 1857, the dividends amounted to 68,508s., or 67 1/2s. per share, against 39,392s., or 58 1/2s. per share, in 1856. The ore sold from the commencement amount to 352,496 tons for 1,630,392 1/2s. 11s., and the total dividends to 609,230s., or 5957s. per share. In last June Review, it was stated that a renewal of the lease for 20 years from Ladyday, 1857, and an addition to the set of nearly 1000 fms. on the course of the lode, had been obtained from the Duke of Bedford, in consideration of the payment of a fine of 20,000s., and a royalty of 1-12th. It was also agreed that the company should have a lease of so much land as might be required to make a railway from the centre of the mines to Morwellham Quay, and during the last few months the great progress has been made in carrying out this important work. It is expected that the line will be in full working order by Nov. next, when the present contract for the carriage of ore and materials, at 5s. per ton, will expire, and a great reduction will then take place in this important item of the monthly costs. There is a very fine course of ore in the eastern part of Wheal Emma, leading directly into that portion of the set which has been recently granted, and from appearances it would seem that this new piece of ground is a very valuable acquisition to the property. Owing to the rapid fall in the standard, the directors have of late decided on reducing the samplings to a very great extent, and it is believed that this precautionary measure will have a beneficial effect. About six months ago the shares rose to 490s., to 470s., but at the end of the year they are much the same as they were at the beginning—about 420s. or 425s. per 1024th.

Meetings of Mining Companies.

LADY BERTHA MINING COMPANY.

The quarterly general meeting of shareholders was held at the offices of the company, St. Helen's-place, on Tuesday, Mr. Oxa in the chair.

Mr. LAYINGTON (the secretary) read the notice convening the meeting, and the minutes of the last, which were confirmed.

The statement of assets and liabilities showed balance against mine, 3934 1/2s. 9d. The following report was then read:—

Jan. 11.—I beg to hand you my report of the work accomplished since your last meeting, together with a statement of the present appearance and future prospects of the mine, which, on the whole, may be regarded as of the most cheering description. Moyle's engine-shaft has been sunk about 12 ft. under the 30; a trip-plat 12 ft. long, 9 ft. wide, and 7 ft. deep has been cut, which will be large enough to take all the stuff that may be broken in that level; to-day the sinking of the shaft will be resumed, and will be sunk 9 ft., where this lift, &c., will be fixed. In the 30 the cross-cut has been driven north 13 ft. to intersect the lode, and through the lode 11 ft., making in all from the north part of the shaft about 5 fms.; the lode at this point of intersection was composed principally of quartz, a little pebble (chlorite), manganite, and spots of ore. The 30 has been extended east and west on the course of the lode, on the south part of it 5 fms. 1 ft., and is now being pushed on as fast as possible by twelve men, six men in each end, at an average price of 10d. 5s. per fm. The eastern end is now about 18 fms. behind Robin's winze, sinking below the 20, and where there is a good lode; the eastern end is 4 fms. behind the cross-course seen in the 20, east of shaft. I consider these points of great importance, and will, when reached, open out some profitable ore ground. The 30 west has been driven 10 fms. 3 ft., making a total distance from Moyle's shaft of 43 fms. 4 ft.; the lode in the present end is about 4 feet wide, and worth 2 tons of ore per fm. This end has now been driven for 14 fms. through a good lode, which has turned out at times as much as 5 tons of ore per fm., and never less than 1 ton of ore per fm., averaging for that length 3 1/2 tons of ore per fm. Hooper's rise in the back of the 20 west, and in the ore ground, is up about 7 feet, where the lode is 3 ft. 6 in. wide, and worth 2 tons of ore per fm.; this rise will be continued on the south part of the lode until a communication is effected with the 10, where the ore ground can be taken away advantageously, and at a good profit. Robin's winze has been sunk below the 30 fm. level 6 fms. 3 ft. 6 in.; the lode in which has materially improved during the last 2 fms. sinking, at the deepest point it being 3 ft. 6 in. wide, and worth 2 tons of rich ore per fm. This winze is temporarily suspended from an increase of water, which the 30 will drain, and when communicated I have no hesitation in saying it will make a very important addition to the ore ground in the mine. The 20 east has been driven east of Moyle's shaft 5 fms. 3 in., or a total distance of 34 fms. 0 ft. 3 in.; the lode in the present end is 2 ft. 6 in. wide, and exceedingly promising, containing good stones of ore; it should be stated, however, that this end has been driven through a good lode, averaging upwards of 2 tons of ore per fm. for 5 fms. 3 ft. The end is suspended, and a rise commenced in the back of the level called Barn's rise, to be communicated with the 10, for the twofold purpose of ventilation and cutting out ore ground; the lode is 2 ft. 6 in. wide, and worth 2 tons of ore per fm. All the machinery on the mine is in good working order. In conclusion, I am happy to say the mine is in a far better position than at the last meeting, and from present appearances will continue to improve; at the next general meeting I hope to be in a position to make an estimate of the ore ground in reserve, but until that time I cannot, as it would be premature to do so in the present state of the rises and winzes.—J. MITCHELL.

The Chairman said it was expressly wished by the committee that the report should be sent up to give the latest improvements, and they had only received that document that morning.

Mr. LELAND, who represented in his own person and on behalf of his friends a very large amount of shares, expressed his dissatisfaction at the position in which the undertaking was placed, and handed up to the Chairman an elaborate report from a most competent authority (the expense of which he had himself paid for), showing how the property might be improved. He concluded, by moving that they should stop sinking the shaft below the 30 fm. level, and drive east and west instead.

Mr. THOMPSON was of opinion they ought to leave it to the committee, who could better work the mine than a general meeting could.

Mr. LELAND said there was one of the committee who only held one share. A SHAREHOLDER said they should not interfere with the committee, but he quite concurred with Mr. Leland, and did not see why they should be going down for the benefit of somebody else, but had better drive east and west. He thought Mr. Leland's move was in the right direction.

The Chairman said he was not the party alluded to as holding one share. He did not consider it was the province of the committee to dictate to Mr. Metherell, as he thought he ought to know what was right.

Mr. LELAND said the question was whether sinking the shaft at the present time was a proper mode of operation.

Mr. MITCHELL explained by a plan of the mines that every 10 fms. they were sinking they were going further from the lode. They should suspend the shaft until they had driven the levels east and west. He was against stopping sinking the engine-shaft, where the engine was in the proper position.

A SHAREHOLDER suggested that Mr. Leland should withdraw his motion, as they could elect him on the committee.

The report and accounts were then unanimously adopted.

The Chairman said, several shareholders having complained of the excessive demand for land damage made by Sir Massey Lopez, a resolution was passed that the committee be requested to apply to Sir Massey Lopez upon the subject.

The Chairman said the next question was the call.

Mr. LELAND moved that a call of 1s. 6d. per share be made.

Mr. BIRDSEY seconded the resolution.

Mr. LAYINGTON observed that if it had not been for the excessive charge for land damage a call would not have been necessary at the present time.

The resolution was then carried unanimously.

Mr. LELAND believed, with great economy and diligence, this would be the last call, as he believed the mine would be able to pay itself, and by June or Sept. a dividend.

The Chairman said they had now to elect a committee for the next three months.

Mr. MITCHELL, in proposing Mr. Leland, paid him a high compliment for the activity he had displayed on behalf of the company, and fully confirmed his statement, that it was one of the cheapest mines in the market. The following were then proposed and elected, *services*.—Mr. Leland, Mr. Williams, Mr. Orr, and Sir T. Tancost.

Mr. LELAND considered they ought to have a captain of their own to attend to the mine. It was only last week he heard that a winze was suspended, and yet no information was forwarded to the secretary.

Mr. BIRDSEY said the sooner the matter was gone into the more beneficial it would be for the shareholders at large.—The proceedings terminated with a vote of thanks to the Chairman.

WEST WHEEL PROVIDENCE MINING COMPANY.

The general meeting of the adventurers was held at the offices of Mr. Allender, Copthall-court, on Wednesday, Mr. P. L. HYNES in the chair.

Mr. ROBINSON (the secretary) read the notice convening the meeting, and the minutes of the last, which were confirmed.

A statement of accounts was exhibited, from which the subjoined is condensed:—

Balance against mine last audit.....	£ 465 4 2
Sept. mine costs and merchants' bills.....	713 2 5
Oct. ditto ditto ditto.....	583 9 6
Nov. ditto ditto ditto.....	735 18 0
Lords' dues.....	60 10 8=2354 4 9
Call of 10s. per share.....	£512 0 0
Ore sold.....	1089 12 5
Carriage.....	7 13 3= 1609 5 8
Balance against adventurers.....	£1044 19 1

The Chairman, in answer to a question, said that the arrears of call only amounted to 46s., and he believed the whole would be paid. He would now propose that the accounts be received and adopted.—The resolution was seconded and carried unanimously.

The Chairman resumed: He would next propose that the report be read. They had not a very cheering prospect, but he believed the worst was passed, not only in mining, but in other commercial affairs in this country. In mining they had most trying times the last three months, but they had to attribute their sufferings to that rapacious set, the smelters; and they had been paying more to the tributers than the adventurers got for the produce. That labour must be brought down in the present state of affairs, had been fully explained in the *Mining Journal*. With regard to the tin smelters, the only way they could do was to withhold the produce until they could obtain a fair and just price. He would now propose that the report of Capt. Thomas be read.—Mr. ROBINSON then read the following report:—

Jan. 12.—The boundary engine-shaft is now sunk 3 fms. 2 ft. 6 in. below the 110, sinking by eight men, at 26s. per fm., and the ground congenial for tin; this shaft is being sunk about 2 fms. to the south of the branch, and about the same distance to the north of the lode, so that both the branch and the lode can be intersected in the 120 by a short cross-cut. The 110 is driven west of Mitchell's shaft, on the lode, about 9 fms.; the lode for this distance has been rather small and poor. The men are now engaged in driving north at this point, to intersect the branch; we have already passed through a small branch, producing good work for tin; the main branch we expect to reach in 2 fms. further driving. The 100, about 7 fms. further west than this end, we had good tin ground, which encourages us to expect that this level will improve; the best tin ground seen in the 100 is yet 14 fms. further west. The 100 is driven west of the lode (west of St. Aubyn's shaft), on the lode, 20 fms.; the lode hitherto has been poor, but the end being now within about 5 fms. of the ore ground driven over in the 90 fm. level, we shall soon have an improvement, or be greatly dis-

appointed. We purpose shortly, when the ground is a little further drained, to commence sinking a winze in the 90, in the ore ground. Our fullest expectation of the 100 turning out well encouraged us to take away all the tin and copper that we could from the upper levels; but the 100 having proved such a failure, and the price of tin so gone back, our returns at present are quite unexpectedly inadequate to meet the cost of carrying on the different operations that would be necessary for fully developing the mine. Hinda's shaft is sunk 2 ft. 6 in. below the 30; about 6 feet above the present depth the shaft greatly improved, and presented more encouraging prospects than we had before seen in this part of the mine; for a short time it was worth from 15s. to 30s. per fm., but though the branch continues its size it is much less productive. The men are now engaged in driving south in the 30, where we shall intersect several branches by driving about 3 fms. in this direction. On Friday last we intersected a small branch in this level, but very good; yesterday we cut into another branch of good size, producing tin, but have not opened on it sufficiently to know its value. The price per ton for tin to tributers being reduced from 60s. to 55s. 6s. 8d., and the tinwork operations being considerably less, together with a general reduction in wages, will very materially lessen the monthly cost. We have now twenty-four men on tinwork, and forty-eight men on tribute.—J. THOMAS.

The Chairman said he believed Capt. Thomas, in alluding to his position, intended to refer to the past and not the future. There was another subject to which he would refer—the reduction of the dues. The Duchy of Cornwall had in many instances most liberally reduced the dues one-half, and he should move a resolution that the lords remit them altogether for the present, as he thought it was but fair they should do so after the great outlay by the adventurers. If they were under the Commissioners of the Church it would be useless to ask them, but fortunately they were in the hands of private individuals. He had also to propose that, to meet their present difficulties, Messrs. Vivian, Grylls, and Co., the bankers, should advance to the pursers a sum of money not exceeding 500s., as under any circumstances it would take some time to get in the calls.

Mr. GREN wished to know what rate of interest would be paid on the advance?

The Chairman replied only 5 per cent., and the whole, he expected, would not be more than 25s. to 30s., and was likely to be a great convenience to the adventurers.

A SHAREHOLDER considered that the report and accounts ought to be in the hands of the shareholders a few days before the meeting, in order that they might be acquainted with the business to be submitted. He did not think they were doing much good lately, and he considered, to make the mine pay, it must be prosecuted with more vigour.

The Chairman said the report only came up in the morning, and the accounts were regularly sent to the offices monthly, and it was their fault if they did not come and examine them. Had the tin kept up to 70s. or 80s. per ton they would have been in a very different position at the present time. It had frequently been pointed out in the columns of the *Mining Journal* how the adventurers in mines were treated by the smelters, who depressed by monopoly the price of the ore, and reaped very large profits in their reduction, and to this cause may be attributed much of their present trouble and loss.

The report was then adopted, and resolutions passed to apply to the lords for a remission of the dues, and that the bankers be authorised to advance to the extent of 500s. to Mr. Robinson, the pursers.

The Chairman said he would now propose a call of 1s. per share, payable forthwith.

A SHAREHOLDER enquired the value of the plant on the mine?

Mr. ROBINSON replied about 3000s.

The resolution making the call was then seconded, and carried unanimously. The committee of management were re-elected, and a vote of thanks tendered to them for services already rendered.

GOVERNMENT SCHOOL OF MINES.

The lecture by Mr. W. SMYTH was on the "Exploration of Mines."

The lecturer alluded to what he had previously stated with regard to the sinking of shafts and the driving of levels. Occasionally between the latter, for the purposes of ventilation and the getting of the ore, what are called winzes were sunk; these were, however, placed at irregular distances, as in general the object was to sink them where they would be productive. A diagram of Levant Mine, which was before them, would show the position in which they were there placed.

He would now speak of the staff, or, if he might so term it, the *personnel* of the mine. In general, especially if it were a large establishment, there was a chief captain: with him there were one or two sub-agents associated, who had to assist him in carrying out the workings. And here he would allude to a system which was now pursued in many mines in Cornwall, and which was highly commendable: he referred to the employment of what are called inspecting captains. These were supposed to be men of superior attainments. They visited the mine, perhaps, once a week, but commonly their inspections only took place monthly. In his opinion, if a mine were worth working, there should always be a resident captain. An agent was appointed to superintend the operations at surface, and he was denominated the grass captain. There were then the men who were employed to see after the engine and rods in the bottom of the shaft; these were denominated pitmen, and had quite a different sphere of duty to the shaftmen. After these came the timbermen, and these, in general, were men of great skill and endurance. In many small mines the men were expected to perform the timbering themselves, but in the larger establishments there were workmen specially appointed for that purpose; and in many instances, to fulfil their work properly, all the skill and knowledge of a carpenter are required, combined with an acquaintance with the proper mode of securing dangerous ground. They had then the tributers, who worked in pitches, and obtained for their labour a certain percentage in the pound sterling value of the ore they raise. The tinwork men were the next branch, who received a certain rate per fathom, according to the nature of the ground they were driving or sinking, as the case may be. Another set of men were those who conveyed the ore to the bottom of the shaft; these were called either tramways or wheelers. There were then the fillers; and at the top were another set, called the loaders. At grass, there were the dressers, the smiths and carpenters, as well as the engine-men: the number of these last depended naturally upon the power of the engine, and the required tax upon their individual energies. Lastly, there were the clerks connected with the counting-house, and the pursers, whose duty it was to pay the men, to purchase stores, check the merchants' accounts, &c., who, he might say, were the financial agents of the mine. On the Continent, in general, a similar set of men was employed. However, where there were rich silver veins, or when gold was disseminated through the vein, a greater number of superintendents would be found, for, unfortunately for the weakness of human nature, the contact of the precious metal has a demoralising influence on the men.

When about to explore a mine, they should look to the inclination, thickness, and depth, as well as the character of the walls; and these observations applied in the same degree to mineral veins as to stratified deposits. In opening a mine they should, 1. Endeavour to keep it clear of water.—2. So dispose of the shafts and levels, as the character of the ore, and the economical as possible of the ventilation, were a great point, not only as regarded the safety and health of the men, but likewise a great saving of time, as sometimes in a shaft or level after a hole was fired the gunpowder smoke would be hanging about for so considerable a period that the men would be obliged to leave their work.—4. While the workings were being explored, to keep the ground prepared for future working.—5. To extract as much useful mineral as possible without any extraneous matter.—6. And this was most important, and if neglected often led to litigation, was to secure the buildings and the surface from falling in, or an average width of from 2 to 6 ft., and this rule would be generally found to apply to Cornwall and Devon, Saxony, the Andriessberg in the Harz, and the north of England. Veins vary much in different localities in width. A question often arises whether the mineral is diffused throughout the vein or disseminated in bunches; and here often had to be taken into consideration whether tribute pitches could be advantageously brought into play. This was often done in some tin veins, and in places where gold was disseminated through the lode. There were two methods of stopping employed in mining, the one called "underhand" and "strosen ban," in German, and the other "overhand" or "foreban." The former was not generally to be recommended. This was often done below the bottom of the shaft, or the sole of the level, but being liable to interruption from water, consequently the first rule laid down had to be violated, and timber was required, and men had to be employed to take out the water; and even when rods were brought from the shaft this was often found inconvenient. The over-hand system was possessed of considerable advantages. The adventurers, however, often require ore to be raised at any cost, and often, against the judgment of the captain and the best miners, peremptory instructions were sent from some London office by parties who were entirely ignorant of the business they professed to understand. In the over-hand stopping one piece of timber was required from below. A small opening, or shaft, of from 2 ft. to 4 ft. square, could be left, for the purpose of throwing down the ore, which could then be wheeled away to the shaft, the refuse being laid on the stall.

Diagrams were shown, illustrating the different modes of stopping. Mr. Smyth then referred to the workings at Alston Moor, where the lode is pretty good, and at about every 15 fms. there will be a rise. These stoppings at Alston Moor are called headings. As a general rule, over-hand stopping is more economical than the method by underhand; instances, however, occur, where the latter is practised with advantage, as at Andriessberg, in the Harz, where there are quantities of red silver, silver-lance, &c.; if the over-hand mode were pursued, and the ore thrown over, much would be lost. The same might be observed of many veins of galena, which were extremely brittle. Where the ground is so hard that firm and heavy blows have to be struck, the under-hand system is the better. At East Wheel Rose the ground is so soft, that if left open for only a short period it will come down by itself. In many mines poor places are left so as to support the superincumbent ground. At the extensive mines of iron pyrites in Wexford, where there is a lode 40 ft. wide, this system is well exemplified. The further considerations the subject would be deferred until the subsequent lecture.—(A condensation of Mr. Smyth's lecture on the Tabbings and Timbering of shafts will be found at page 49 of the Journal for 1857.)

The lecture, by Dr. PHACY, was on the "Amalgamation of Silver."

He had previously described to them the process by which this was effected in Mexico. Several of the chemical re-actions occurring had been described by Carsten in the "Archiv." for 1852. The lecturer then alluded to the reactions which occurred with chloride of copper and metallic silver, chloride of copper and sulphide of silver, and di-chloride of copper and sulphide of silver. Although much had been written on this subject, it was very far from being satisfactorily investigated at present; and there was a great field open for further researches in this important matter. When chloride of silver is obtained, it is easily reduced by mercury. A good account of the Mexican method would be found in the "Annales des Mines." The method he had spoken of was that practised at Zacatecas. Although there were several different modes of procuring this system of amalgamation in Mexico, yet there was not much variation; the loss sometimes was as much as from 10 to 24 ozs. of mercury to the mark of silver. When gold occurs in the ore, a little mercury is put in the arrastre, and this is not removed for some time; the loss in some places is calculated to be only from 5 to 7 per cent., while at Fresnillo, where the ore is galena, pyrites, and blende, it is stated to amount to 28 per cent. At Zacatecas, where the ore is a quartzose vein, the difference between the assay and the product is from 35 to 40 per cent. It has been proposed to substitute an amalgam of copper and mercury, but he had not heard that this had been successfully carried out. The consumption of mercury in Mexico was stated to be 2,000,000 lbs. yearly; in Chili, Peru, and Buenos Ayres, it was estimated to amount to 1,250 tons.

He would now refer to the amalgamation process as practised at Freiberg, in Saxony. At present the furnace and apparatus had been taken down. In the year 1738, amalgamation works were erected at Kongsberg, in Norway; and in 1780, they were introduced at Schemnitz, in Hungary. At Freiberg, works of this description were built in 1790; afterwards burnt down, and subsequently re-erected in 1794. The

silver in the ore is a sulphide, which is converted into a chloride by roasting in contact with common salt, in presence of a sufficient quantity of iron pyrites, chlorine being generated. This is brought into contact with iron and water. The amalgam is then submitted to pressure in the ordinary way, and afterwards reduced by heat. The mercury is evolved, and contains a portion of silver; but, as it has to be reduced again, the precious metal is recovered. A good description of this process, by Mr. Vivian, will be found in Taylor's "Records of Mining." On looking at the diagram, they would perceive that the works were divided into four compartments, each being separated from the other by a wall. The first process is the roasting; the ore ought to be reduced to a fine state of division, and then mixed carefully with common salt. The average produce ought to be from 70 to 80 ozs. of silver to the ton of ore. The best ores are dry—that is, free from lead. A layer of ore is first placed, and over this the salt is uniformly levelled. The charge which is let down is about 4 cwt. The furnace is a reverberatory one, with several modifications; and in these it differs from those commonly employed. The bed is in two parts, the one farthest from the fireplace being slightly raised. On this at first the ore is placed, and subsequently they are pushed on to the lower. The roasting must be effected with great care, and every precaution in these works is taken to prevent loss on the one hand, and pilling on the other. The flame, they would perceive from the plan, went circuitously, in order to prevent any of the silver from being carried away by mechanical means. Great care is always required at the first part of the operation, or else eluting ensues. Towards the close of the process the temperature is gradually raised, and the sulphur then burns. The ore, being roasted, is then lifted to the upper part of the works by simple machinery, and is afterwards sifted on a species of inclined sieve; and that which passes through the sieve is fit for the subsequent processes. What remains is again broken up, and mixed with about 3 per cent. more of salt. After this it is again reduced, then sifted, and sorted into suitable sizes. It then goes through a hopper, and is passed to mills which have stones of granite, where it is ground to an impalpable powder. After this, the ore is raised again, and put into barrels with mercury, iron, and water. The machinery is put in motion by two overshot water-wheels. All the barrels, of which there are four rows, can be stopped simultaneously or alone. The boxes above contain the charge, and to these there is attached a sucking, which has a mouthpiece of iron, that can be fitted in the bung of the barrel. A little elstern is under the box, which has the necessary quantity of water. Between each there runs a pipe, which goes to a mercury reservoir in a separate compartment; and there is another pipe below, which is a sort of filter. There is likewise a trough underneath, and this is used as a channel to the washing apparatus, which is constructed on nearly the same plan as the Mexican lavadero. The liquid amalgam is passed through a strong linen filter. No great amount of silver can be lost, as the mercury is used again. The subsequent amalgamation is effected by heat. The barrels are 2 ft. 8 in. long, by 2 ft. 6 in. diameter at the widest part; the bunglehole is 5 in. At one end of the barrels there is an iron plate, with teeth, by which they are set in motion. The charge is always let down from the box; the iron is in small bars, which are removed from time to time; the water is in a flat put in, then the ore; the barrels require occasionally to be examined, in order to ascertain if there be a deficiency or an excess of water. The rapidity of the motion must likewise be looked to, and great care must be taken in order that the mud may not be too thick or too thin—both extremes should be avoided. He had, in the vicinity of London, been present at some experiments in gold amalgamating: when the mud was examined it was nearly of the consistence of stone, and he need not tell them how unfavourable this was for the mercury to touch every particle of the metal. When the barrel is about two-thirds full, the mercury is added. In general it revolves about 16 or 18 times in a minute, and this process continues for 15 hours. After some time the temperature is increased; and if the process goes on favourably, more water is added. The time of filling is about five or six hours, and the whole process lasts about 24. From an assay of the amalgam, it appeared that there were—Mercury, 84 1/2; silver, 11 1/2; copper, 3 1/2; antimony, 0 1/2; zinc, 0 1/2; lead, 0 1/2. The loss of mercury is said to be 2 per cent. The weight of the amalgam on the tripod, below the bell, is about 3 cwt. The object of the washing is to collect any particles that may be remaining. The time is about 5 to 9 per cent. for the mercury to remain in the box is from three to five minutes, and this process continues for 15 hours. After some time the temperature is increased; and if the process goes on favourably, more water is added. The time of filling is about five or six hours, and the whole process lasts about 24. From an assay of the amalgam, it appeared that there were—Mercury, 84 1/2; silver, 11 1/2; copper, 3 1/2; antimony, 0 1/2; zinc, 0 1/2; lead, 0 1/2. The loss of mercury is said to be 2 per cent. The weight of the amalgam on the tripod, below the bell, is about 3 cwt. The object of the washing is to collect any particles that may be remaining. The time is about 5 to 9 per cent. for the mercury to remain in the box is from three to five minutes, and this process continues for 15 hours. 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the great north lode of iron; in our progress, however, we have been somewhat delayed, or taken aback, by suddenly coming on a hard bed of quartz; but it is now wearing out, and there is a very marked improvement in the lode itself. It is our

In the 108 north it is 2 ft. wide, and worth 61. per fm.—South Mine: The lode in the 142, south of Trevelyan's shaft, is 3 ft. wide, and worth 81. per fm. In the north end the men are still engaged in cutting through the capels of the lode. The lode in the 180 south is 3 ft. wide, and worth 191. per fm. We have commenced to drive the 107 end north, where the lode is 20 in. wide, containing a little ore. We have also commenced to sink a winze in the bottom of the 92 north, the lode in which is 3 ft. wide, and worth 101. per fm. The stopes in the back of the 108, north of Chilpendale's, are not quite so productive as they have been.

WHEAL UNION.—T. Glanville, Jan. 8: The following is the talwork setting:—The 30 to drive west of engine-shaft by six men, at 71. 10s. per fm.; the 30 to drive east of engine-shaft by six men, at 84. per fm. The 20 to drive west of engine-shaft, on the south lode, by four men, at 64. per fm.—lode 2 feet wide, producing stones of copper ore; the 20 to drive east of engine-shaft, on the south lode, by four men, at 51. per fm.—lode worth 201. per fm. for tin; the 20 to drive west of engine-shaft, on the north lode, by four men, at 31. per fm.—lode 3 feet wide, composed of spar, mndic, and stones of ore. The winze to sink under the 20 by four men, at 24. 10s. per fm.; the 20 to drive east of engine-shaft, on the north lode, by four men, at 24. 10s. per fm.—lode 2 ft. wide, producing stones of copper ore. The western shaft to sink below the 20, on the south lode, by nine men, at 111. per fm.—lode 4 feet wide, producing stones of yellow copper ore.—Tribute Setting: A pitch in the bottom of the 20, on the south lode, to extend from point of horse 16 fms. east and 5 fms. below, to four men, at 5s. in 11. tribute. A pitch in the back of the 20, on the south lode, to extend from point of horse 17 fms. east and 10 fms. high, by four men, at 4s. in 11.

WHEAL ZION.—J. T. Phillips: In the 30 west the lode is large and kindy, with a leader of mndic, peach, and spar about 15 in. wide, producing good stones of copper ore. In the 50 west the north lode is about 2 ft. big, a hard coal, intermixed with mndic, and occasional stones of copper ore. In the 80 west the lode is small, with spots of copper ore; the ground is low for driving. In the 65 east we have no change worthy of notice. In the 68 cross-cut south the ground is favourable for driving: we have driven through a branch of the elvan course. In the north cross-cut the ground is much the same.

WILLOW BANK.—J. Sanders, Jan. 11: Since writing my report on Saturday, I have been searching every hole and corner, to find out where the water was coming out of the mine; the result is as follows:—About 20 fms. west of the wheel-pit, at a level corresponding with the top of the water in the shaft, I found the water on one side of the river very much discoloured, by which I was led to believe that this was the place where the water was coming out. I put a bar of iron down in the bed of the river 5 ft., after which the water came up very black. Since then we have turned the river on the side, and resumed the pumping, and I am happy to say that as the water forked in the shaft, as it went down in the bed of the river. We have taken up the water from this place with launders and other temporary things, and cleared up the river; by so doing we have found a very loose, hollow lode crossing the river, the size and character of which I cannot say at present, as there has not been time as yet to open it. The lode is 8 fms. north of the main lode, and the place the water was going down is 30 fms. west of the cross-cut. We shall commence to-morrow to cut a new course for the river, and after we have secured the water we shall open a little on the lode, to ascertain its bearing and appearance. The water is forking very well at present, and hope in a few days to see the bottom of the shaft again.

YARNER.—H. Richards, Jan. 13: The engine-shaft is 5 fms. below the 10; there is a branch of the capels of a lode, coming in from the south side of the shaft, which is spotted with ore, and which we shall see more of when we resume sinking again. The stopmen have commenced to drive to divide down the engine-shaft, preparatory to drawing with the machine, which we shall get to work as soon as possible. The 10 fm. level, driving east, is still looking very promising, and we hope for further improvement as we go further into the hill, and I hope you will soon have a good mine. The 10 fm. level is set to drive at 41. 5s. per fm. We shall commence immediately to lay open the ore floor.

The Great Wheal Vor committee of investigation have issued their report in anticipation of the meeting to be held on Wednesday, from which the following is condensed:—After a laborious and, so far as the time allowed, a careful inspection of the books of the company, which were submitted to our examination, and eliciting also the evidence of all those persons within our reach who we considered could give us testimony on the different matters to be enquired into, we have, from the abundant information derived from those sources, arrived at the conclusion that the committee of management have wholly failed in exercising that salutary supervision over the company's affairs which their duty to the shareholders imperatively required. From the very commencement there seems to have been extraordinary, and almost uncontrolled, powers allowed to the managers. The report is divided under the following heads:—The original constitution of the company; the income and expenditure; the present position of the mines; and suggestions for the future management. The original constitution of the company has been already published. The income and expenditure shows, upon the capital account to Dec. 21, 1857, there had been received, 353,396l. 4s. 2d.; expended, 291,769l. 3s. 10d.—Present position of the mine: Whilst we must refrain from giving any opinion of our own, of which, indeed, we feel incompetent, not being miners, we must state that the concurrent testimony of all such mining captains and persons, on whose great pains to elicit the truth on this head, was that the Great Vor Mines is a property of great and intricate value, and one which is deserving attention; and if properly and judiciously managed will remunerate the adventurers for the outlay that has been, and has yet to be, made to get to the bottom of the mine.—Suggestions for the future management: The result of our investigation, after the most deliberate consideration, is, in addition to a London management, that there should be a local committee, to consist of no less than four shareholders, who should superintend and direct the working of the mine, in conjunction with the general committee, of which each four local committees should form part. We would also mention that we have an interview with the representatives of the Duke of Leeds, Mr. Trevelyan, and Mr. Popham, and we have reason to hope the appeal we have made for a remission of dues on ores raised in the deeper parts of the mines will be favourably entertained for a certain period. With respect to Wheal Metal, we have also appealed to Mr. Trevelyan for a reduction of the dues, and we trust that the grounds on which the reduction is asked for will also receive his favourable consideration. The committee have, doubtless, shown the necessity of the enquiry in which they have been engaged, and that considerable improvement can be effected in conducting the affairs of the company, but we hope that the more serious allegations can be disproved on explanation, and thus remove the odium from the parties implicated. The manager, Mr. H. P. P. Cress, at their request, has resigned, and we understand that an entire reform in the management is contemplated. We trust the proceedings of the meeting on Wednesday will be conducted in an amicable spirit, and that the object of all will be to see how best to remedy existing defects, and to so place the vast undertaking that it may prove creditable and remunerative.

THE TORBANE HILL MINERAL.—The case of Russel v. Gillespie will shortly be heard in the House of Lords, and anything that is calculated to decide what is and what is not coal is, therefore, of the greatest interest. It is an accepted rule that an argument cannot be carried on unless the disputants have some single point on which they agree, and which they can employ as a basis; and we know of no more careful definition of the character of coal, and the distinction between it and other similar substances, than that given by Prof. Goppert, a translation of which was inserted in the *Mining Journal* of Dec. 26. This definition being accepted, there can be but little difficulty in deciding the nature of the Torbane Hill mineral, and hence the rights of the parties to the suit, as it is acknowledged that it consists of about 25 per cent. of argillaceous base, combined with 75 per cent. of oil. The clay is of a peculiar nature, and capable of extended industrial application; but the most important means of subjecting it, when broken into small pieces, to the action of a slow fire. The oil thus yielded passes through stages of chemical purification of the simplest nature. It passes through one or more of these stages, according to the object had in view. This oil has several singular properties. Unlike other oils known in commerce, it suffers no detriment from exposure to the atmosphere. It is not liable to that oxidation or oxygenation which affects other oils, and destroys in its course so large a proportion of all objects in nature. It is employed for lubricating machinery, and being capable of being made as thin and fine as the purest brandy, it will lubricate without clogging, and successfully, the most operative and delicate machinery, not being liable, as we have said, to corrosion from the injurious influences of atmospheric air. This paraffine oil is now prepared in vast, or rather enormous, quantities. For lubricating purposes it is now indispensable to much of our machinery. For illuminating purposes it, simply used as paraffine oil, is quickly superseding all other oils; while a lamp of peculiar construction, which this liquid requires, is coming into use as universal use, in all cases where gas is not employed, such as in farm-houses, and country houses generally; and this leads us to speak of the application of this important mineral substance, or rather of that paraffine oil of which we have already spoken, because, in truth, the gas yielded by this substance comes from that oil, which makes up the four-fifths of the material. With reference to the question in dispute, it may be added that on the Continent it is universally recognised as a peculiar bituminous clay, or *schiste bitumineux*. As such, it is admitted into all the ports of the Zollverein, duty free, a duty being levied on all coals.

MINING IN THE ARIZONA DISTRICT.—Some considerable discussion has taken place in the *Mining Journal*, with reference to the mineral wealth of the United States territory known as the Gadsden Purchase, which all allow to be capable of yielding both copper and silver in abundance, capital and energy alone being required to overcome the local difficulties which have been so loudly spoken of. The Gadsden Purchase was immediately upon its acquisition, annexed to the territory of New Mexico, which has all the capabilities of being formed into two or three independent and gigantic states. A movement as commenced at Washington for forming the Mesilla Valley lands into a separate state, to be called "Arizona;" and it is anticipated that the mining activity of new state will surpass anything hitherto witnessed, a brief reference to the several uses already at work will, therefore, be not uninteresting. The proposed state will embrace 50,000 square miles, and is watered by the Rio Grande, Gila, and Colorado. The Arizona Copper Mining Company have already commenced operations, and now employ about 100 Mexican miners. This company is incorporated under the laws of California, has a capital of 200,000l., and, at a large expense, has supplied the mines with water, extracted several hundred tons of ore, and erected buildings, smelting furnaces, and other appliances to facilitate their working. It is said that the cost of ore delivered at Swansea is 25s. per ton, that it is worth from 40s. to 75s. per ton, and that a portion of the mine is owned by English capitalists. The SONORA COPPER AND MINING COMPANY was established in 1856 by some citizens of Ohio, with a capital of 400,000l., and has purchased the rancho of Arivaca, containing several silver mines, and 17,000 acres of valuable land; the offices of this company are in Cincinnati. The SONORA SILVER MINES affords its proprietors a handsome profit, although at present worked in the poorest manner; it is a remarkable property, only requires capital for its extensive development. The GILA RIVER COPPER MINES will, however, it is anticipated, yield the greatest results; since the ores can be taken from the vein and immediately shipped down the Colorado to the head of Gulf of California, where they can be transhipped to England at a small cost. Several of twenty veins of copper ore have been opened, and the assays give results varying from 30 to 70 per cent. It is anticipated that the first cargo will be shipped to England during the present year.

STEEL.—We learn that the Uchatius process has been tried by an experienced manufacturer in Rhein Prussia with but indifferent success, there being difficulty in obtaining uniform results. We hope shortly to be in possession of further information with reference to the progress of the invention in Prussia.

The Mining Market; Prices of Metals, Ores, &c.

METAL MARKET, London, January 15, 1858.

COPPER.		S. S. d.	
Copper wire	p. lb.	0 12	- 1 3/4
ditto tubes	p. lb.	0 12	- 1 3/4
Sheeting and bolts	p. lb.	0 10	- 1 3/4
Bottoms	p. lb.	0 10	- 1 1/4
Old (Exchange)	p. lb.	0 10	- 1 1/4
Best selected	p. ton	110	0 0
Tough cake	p. ton	107	0 0
File	p. ton	107	0 0
South American	p. ton	95	0 0-100 0 0
LEAD.			
Barre, Welsh, in London	p. ton	7 10	0 0-8 0 0
ditto to arrive	p. ton	7 5	0 0
Nail rods	p. ton	8 0	0 0
in stock to arrive	p. ton	9 0	0 0-9 10 0
St. Stafford, in London	p. ton	13 0	0 0-10 0 0
ditto ditto	p. ton	10 0	0 0-10 10 0
Sheets, single	p. ton	10 0	0 0-10 10 0
Sheet, No. 1, in Wales	p. ton	3 15	0 0-4 5 0
Refined metal, ditto	p. ton	4 10	0 0-5 5 0
Bars, common, ditto	p. ton	6 7	6 0-8 10 0
Ditto, railway, ditto	p. ton	6 10	0 0-8 15 0
Ditto patent shot	p. ton	25	10 0-25 10 0
Pig, No. 1, in Clyde	p. ton	2 18	0 0-3 0 0
Ditto, in Tyne and Tees	p. ton	2 15	0 0-3 0 0
Ditto, forge	p. ton	2 15	0 0
Staffordshire Forge Pig	p. ton	4 10	0 0-5 0 0
Welsh Forge Pig	p. ton	3 0	0 0-3 5 0
ZINC.			
English Pig	p. ton	21	10 0-22 0 0
Ditto sheet	p. ton	22	10 0-23 0 0
Ditto lead	p. ton	24	10 0-25 15 0
Ditto white	p. ton	27	0 0-30 0 0
Ditto patent shot	p. ton	25	10 0-25 10 0
Spanish, in bond	p. ton	21	10 0-22 0 0
American	p. ton	none	

* At the works, 1s. to 1s. 6d. per box less.

REMARKS.—The improvement that has lately taken place in the demand for metals generally continues to increase, and great firmness is now evinced by most sellers. Not only have prices assumed an upward tendency, but in many cases business has been transacted at advanced rates. The existing feeling seems favourable to extended operations; it is, therefore, not improbable the most sanguine expectations may be realised in a short time; the reduction in the Bank rates yesterday greatly encouraging such prospects. The only movement that is likely in any way to interfere with the general progress of trade is too much eagerness on the part of sellers to obtain enhanced rates; a few speculative purchases being effected very soon influences holders to demand higher prices, but unless quotations are based upon the legitimate demand, we shall probably be subject to a good deal of fluctuation. At these low prices speculators, now that money is getting so much cheaper, may be inclined to operate, but if sellers wish to preserve a steady market it is necessary to exercise much caution in such operations. Foreigners will have observed the reduced quotations, and, doubtless, will be ordering over all descriptions of metals in large quantities, at limits ruling about the current prices, but, as a matter of course, these orders will be returned should the market advance in the meantime, and consequently *bona fide* business suspended until further advice. We trust that prices will rise gradually, and not be forced beyond a proper point.

COPPER.—There is more enquiry for shipment; very many orders have been put in hand for sheet and sheathing. Cake has also been in better request; several parcels of foreign have changed hands at rising prices.

IRON.—In rails there has been a further improvement in prices, and 61. 10s., nett cash, has been paid for several thousand tons, and 61. 15s. less 3 per cent. discount. English bars are held firmly at 61. 10s., f.o.b. at the works. Swedes iron, of Indian specification, is now quoted 141. In Scotch pigs there has been a steady but quiet market, mixed numbers for the most part having been sold about 55s. 6d.; sellers on 'Change quoted 56s., mixed numbers, g.m.b., f.o.b. in the Clyde.

LEAD.—Sellers report a little better feeling in this metal, prices, however, are not any higher. The market closes steady, and quotations are firm at 21s. 10s. to 22s. for English pig, and 22s. 15s. for sheets.

SPELTHER.—Within the last few days 20s. per ton upon previous rates has been paid for about 200 tons; small parcels have been sold at 26s.

TIN.—In English qualities at present no alteration in fixed prices has been announced; nevertheless, smelters object to sell in the market, and a rise is, therefore, shortly anticipated. Straits and Banca have advanced; both these qualities have been reported to have been sold at 115s., but since buyers state that they have purchased at 110s., there appears at the moment some slight difficulty in quoting the correct price, consequently the medium would perhaps be nearest to its value; the principal of the enquiry seems to emanate from parties desirous of speculating, and under such circumstances it scarcely appears right to make any change in English until the true position of the metal is arrived at. The upward tendency in Holland seems for the moment arrested, the last accounts stating the market to be rather quiet at 67 fl. To have a substantial reason for raising the price is essential, otherwise, perhaps, smelters would have to concede again, which would be unwise in the present state of things.

TIN-PLATES.—Large parcels have been sold, and we now quote 1s. per box higher, but few manufacturers will sell under 26s. to 27s. per box, f.o.b. at the works.

STEEL.—Our market is nearly cleared out of hammered Swedish keg; rolled still remains at 17s. to 18s.

LIVERPOOL, JAN. 14.—Our iron market continues to exhibit an improved tone generally, and a considerable business has been done in Welsh bars at 71. per ton, f.o.b. here, the minimum figure for good brands. Makers are indisposed to accept large specifications, or contracts for forward delivery, even at present prices. For Staffordshire iron, also, there is more demand, now that prices are definitively fixed, and for good makes current rates are well supported. Scotch Pig-iron rules rather lower than on this day week, the business transacted having been very limited. The shipments are good for the season, being 6905 tons, against 5067 tons for the corresponding week of last year; the market closes quietly, at our quotations. English Tin shows no change, and the demand is steady; foreign has advanced in price during the week, consequent upon an increased enquiry. Tin-plates are considerably firmer, and prices show an upward tendency; a fair business has been done during the past week. The demand for Copper is quiet; prices remain unaltered. Lead is in but limited request, and for a good quantity lower prices would be accepted. The following are the quotations:—Iron: Merchant bar, 61. 15s. to 71. 5s. per ton.—Tin: Common block, 108s. per ton; common bar, 109s.; refined block, 110s.—Tin-plates: Charcoal, 10s. 6d. to 33s. 6d. per box; coke, 10s. 27s. to 27s. 6d.—Lead: English sheet, 23s. per ton; English pig, 22s. Copper: Cake and tile, 107s. 10s. per ton; best selected, 110s. 10s. per ton; sheathing and bolt, 1s. per lb.—Yellow metal sheathing, 10d. per lb.—Steel: Blistered, 30s. to 40s. per ton; spring, 18s. to 24s.; cast and shear, 50s. to 60s.

ROTTERDAM, JAN. 12.—Within the last few days a little more has been doing in Banca tin; 500 slabs have been sold at 65 fls.; 200 at 66 fls.; and 300 at 67 fls.

BOMBAY, DEC. 18.—The sales of metal have been limited, and prices have somewhat declined. British bar-iron fetches from 33 1/4 rs. to 34 rs. per candy; hoop and sheet iron, 6 rs. per cwt.; tile copper, 61 rs.; sheet ditto, 72 rs.; spelter, 16 1/2 rs.; yellow metal sheathing, 60 rs. Freight is lower.

Plumbago may be purchased at lower rates; Ceylon, 7s. to 11s. per cwt.; German, 8s. to 10s.; and Spanish, 7s. to 10s. per cwt. In the corresponding week of last year Ceylon was worth from 10s. to 14s.; German, from 8s. 6d. to 13s.; and Spanish, from 7s. to 12s.

The price of English Sheet Steel has not materially varied for some time past; it is now quoted 40s. to 55s.

Lump Arsenic sells at 22s. per cwt., being an advance of 1s. 6d. as compared with the corresponding week of last year; and powdered at 13s., being an advance of 6d.

Antimony ore, crude, and regulus, are quoted the same as last week, but no business is reported.

The demand for Saltpetre has improved, and during the past week a large quantity has changed hands. Ref. 14 per cent. is worth 34s., although privately transactions have been effected at lower rates, parcels of ref. 11 1/2 to 11 per cent. having changed hands at 34s., and 7 1/2 to 7 per cent. at 38s. Refined fetches from 41s. 6d. to 42s. 6d. At the close of last

week there was nearly three times the quantity in stock as at the close of the corresponding week of last year. On Thursday the advertised sales were large, and an extensive business was done, without material change in prices. About 1200 bags of ref. 15 to 14 per cent. sold at 35s.; 8 per cent. realised 37s. 6d.; and fine crystal 41s. 6d. On Tuesday 564 bags, and on Wednesday 52 bags, of Bengal are advertised for sale.

MINES.—The demand for mining shares has increased during the week, so that great difficulty has been experienced in getting stock to deliver. Purchasers seek to buy at quotations which they have been accustomed to see for a long time past, whilst holders are not anxious to sell, even at advanced rates. Banca tin has advanced to 115s. per ton, and both copper and lead are firmer. Thus, with the cheapness of money, and the want of means to employ it, a greatly increased amount of attention will be directed towards mines, and already the enquiries for good stock on the part of the public are unprecedented. Many mines are now being purchased to pay 20 per cent., but such will not long be the case, from the general advance in prices, and a range of 10 to 15 per cent. on good mines is the percentage likely to be kept up. Progressive mines, and low priced speculative shares, are also in demand, and looked upon by many as the favourites.

Devon Consols keep at 420 to 425; Wheal Edward, 7 1/2 to 7 3/4; Lady Bertha, 16s. 6d. to 18s. 6d. In Trevelyan a very large business has been doing, at 26 1/2 to 27 1/2; at the meeting, in a few days, a dividend of 2s. per share can be declared, and a large balance carried over, whilst the late improvements in the mine give promise of increased returns; some of the ore broken by the manager from the 142 (bottom level, just out) has been assayed, and yielded 80 per cent. for lead and 116 ozs. 13 dwts. of silver to the ton of ore; the average quantity of silver to the ton last year, from the upper levels, was 40 ozs. to the ton. Mary Ann shares have been more enquired for this week, at 44 1/2 to 45 1/2; Tamar Consols, 20s. to 21s., and enquired for; East Basset, 9 1/2 to 9 3/4; Basset in demand, at 150 to 170, but no sellers to be found; South Frances flat, at 195 to 200; West Basset have been sought after, at 23 1/2 to 24 1/2; 25; North Basset not quite so good, at 14 to 15; Alfred Consols, 12 to 13, and very little doing; in Great Alfred there is more doing, at 4 1/2 to 4 3/4. Margery shares in demand, and have been done as high as 9; the mine has greatly improved, and looking better now than when shares were double the present price. Redmoor, 3 1/2 to 3 3/4, and a very large business done, the low price tempting many to prefer a small speculation, where the calls are likely to be small, and the probabilities of a rise considerable. Harodfoot, 7 1/2 buyers, but few sellers to be found; the ore just sold has realised a good price; one fact in relation to the mine is worth noticing—that for the return, extent of working, and men employed, it is the cheapest worked mine in the district. Kitty (Lelant), 12 to 12 1/2; Grambler and St. Aubyn, 80 to 85, but no sellers; North Frances, 11 to 11 1/2; South Carn Brea have been in demand, at 5 to 5 1/2; Great South Tolgas, 14 1/2 to 15 1/2, and sought for; Rosewarne, 21 to 22; South Tolgas, 110 to 120; Wheal Grenville, 1 1/2 to 1 3/4; West Grenville, 4s. to 5s.; Wheal Harriet, 5s. to 6s.; Sortridge Consols, 1 1/2; East Gunnis Lake and South Bedford, 1 1/2 to 1 3/4; Great Badern, 17s. 6d. to 18s. 6d.; Wheal Hender, 2 1/2 to 2 3/4; Garrog, 3 1/2 to 3 3/4; North Robert, 3 to 3 1/2, and a great many enquiries made for them; the mine is now making a small profit, with a probability of increased returns. Castell, 1 to 1 1/2; this mine is expected to turn out well, and shares are a little enquired for. Par Consols, 17 1/2 to 18; West Par, 3 1/2 to 3 3/4; Russell, 2 1/2 to 3 1/2; Virtuous Lady, 20s. Bryntal, 2 1/2 to 3; a few weeks ago these shares were unsaleable at 5s. per share, and now, from the improvements in the mine, a good business has been doing at the above quotations. Cwm Erfin, buyers at 8, but no sellers; South Tolgas enquired for, at 110 to 120; St. Day United, 3 1/2 to 4 1/2, and shares in request, a considerable improvement having taken place in the mine; Pendennis, 3 1/2 to 3 3/4; Nanteos, 1 1/2; Cwm Sebon, 1 1/2 to 1 3/4; Yarnor, 1 1/2 to 1 3/4; Trowetha, 3 1/2 to 3 3/4.

Mining Exchange Official List of transactions during the week:—

SATURDAY, JAN. 9.—Great Alfred, 4 to 4 1/2; Great Badden, 16s.; Lady Bertha, 16s. 6d. to 17s.; Margery, 6 1/2 to 7 1/2; North Basset, 14 1/2 to 15 1/2; Virtuous Lady and Bedford, 22s. to 24s.; Wheal Trevelyan, 26 1/2 to 27.

MONDAY.—East Gunnis Lake and South Bedford, 1 1/2 to 1 3/4; Great Alfred, 4 1/2 to 4 3/4; Kelly Bray, 22s. 6d.; Lady Bertha, 16s. 6d. to 17s.; Margery, 5 to 5 1/2; Pendennis, 3 to 3 1/2; Sortridge Consols, 28s. 20s. 26s. 27s.; Vale of Towry, 16s. 6d. to 17s. 6d.; West Grenville, 4s. 4s. 3d. 4s. 4d. 4s. 5d. 4s. 6d. 4s. 7d. 4s. 8d. 4s. 9d. 4s. 10d. 4s. 11d. 4s. 12d. 4s. 13d. 4s. 14d. 4s. 15d. 4s. 16d. 4s. 17d. 4s. 18d. 4s. 19d. 4s. 20d. 4s. 21d. 4s. 22d. 4s. 23d. 4s. 24d. 4s. 25d. 4s. 26d. 4s. 27d. 4s. 28d. 4s. 29d. 4s. 30d. 4s. 31d. 4s. 32d. 4s. 33d. 4s. 34d. 4s. 35d. 4s. 36d. 4s. 37d. 4s. 38d. 4s. 39d. 4s. 40d. 4s. 41d. 4s. 42d. 4s. 43d. 4s. 44d. 4s. 45d. 4s. 46d. 4s. 47d. 4s. 48d. 4s. 49d. 4s. 50d. 4s. 51d. 4s. 52d. 4s. 53d. 4s. 54d. 4s. 55d. 4s. 56d. 4s. 57d. 4s. 58d. 4s. 59d. 4s. 60d. 4s. 61d. 4s. 62d. 4s. 63d. 4s. 64d. 4s. 65d. 4s. 66d. 4s. 67d. 4s. 68d. 4s. 69d. 4s. 70d. 4s. 71d. 4s. 72d. 4s. 73d. 4s. 74d. 4s. 75d. 4s. 76d. 4s. 77d. 4s. 78d. 4s. 79d. 4s. 80d. 4s. 81d. 4s. 82d. 4s. 83d. 4s. 84d. 4s. 85d. 4s. 86d. 4s. 87d. 4s. 88d. 4s. 89d. 4s. 90d. 4s. 91d. 4s. 92d. 4s. 93d. 4s. 94d. 4s. 95d. 4s. 96d. 4s. 97d. 4s. 98d. 4s. 99d. 4s. 100d. 4s. 101d. 4s. 102d. 4s. 103d. 4s. 104d. 4s. 105d. 4s. 106d. 4s. 107d. 4s. 108d. 4s. 109d. 4s. 110d. 4s. 111d. 4s. 112d. 4s. 113d. 4s. 114d. 4s. 115d. 4s. 116d. 4s. 117d. 4s. 118d. 4s. 119d. 4s. 120d. 4s. 121d. 4s. 122d. 4s. 123d. 4s. 124d. 4s. 125d. 4s. 126d. 4s. 127d. 4s. 128d. 4s. 129d. 4s. 130d. 4s. 131d. 4s. 132d. 4s. 133d. 4s. 134d. 4s. 135d. 4s. 136d. 4s. 137d. 4s. 138d. 4s. 139d. 4s. 140d. 4s. 141d. 4s. 142d. 4s. 143d. 4s. 144d. 4s. 145d. 4s. 146d. 4s. 147d. 4s. 148d. 4s. 149d. 4s. 150d. 4s. 151d. 4s. 152d. 4s. 153d. 4s. 154d. 4s. 155d. 4s. 156d. 4s. 157d. 4s. 158d. 4s. 159d. 4s. 160d. 4s. 161d. 4s. 162d. 4s. 163d. 4s. 164d. 4s. 165d. 4s. 166d. 4s. 167d. 4s. 168d. 4s. 169d. 4s. 170d. 4s. 171d. 4s. 172d. 4s. 173d. 4s. 174d. 4s. 175d. 4s. 176d. 4s. 177d. 4s. 178d. 4s. 179d. 4s. 180d. 4s. 181d. 4s. 182d. 4s. 183d. 4s. 184d. 4s. 185d. 4s. 186d. 4s. 187d. 4s. 188d. 4s. 189d. 4s. 190d. 4s. 191d. 4s. 192d. 4s. 193d. 4s. 194d. 4s. 195d. 4s. 196d. 4s. 197d. 4s. 198d. 4s. 199d. 4s. 200d. 4s. 201d. 4s. 202d. 4s. 203d. 4s. 204d. 4s. 205d. 4s. 206d. 4s. 207d. 4s. 208d. 4s. 209d. 4s. 210d. 4s. 211d. 4s. 212d. 4s. 213d. 4s. 214d. 4s. 215d. 4s. 216d. 4s. 217d. 4s. 218d. 4s. 219d. 4s. 220d. 4s. 221d. 4s. 222d. 4s. 223d. 4s. 224d. 4s. 225d. 4s. 226d. 4s. 227d. 4s. 228d. 4s. 229d. 4s. 230d. 4s. 231d. 4s. 232d. 4s. 233d. 4s. 234d. 4s. 235d. 4s. 236d. 4s. 237d. 4s. 238d. 4s. 239d. 4s. 240d. 4s. 241d. 4s. 242d. 4s. 243d. 4s. 244d. 4s. 245d. 4s. 246d.

THE PROGRESS OF MINING IN 1856. BEING THE THIRTEENTH ANNUAL REVIEW.

By J. Y. WATSON, F.G.S., Author of the *Compendium of British Mining* (published in 1843), *Gleanings among Mines and Miners*, &c.

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Just published, demy 8vo., with Twenty Illustrations on Copper, price £1 5s., an **ELEMENTARY TREATISE ON IRON METALLURGY,** UP TO THE MANUFACTURE OF PUDDLED BARS: Built upon the Atomic System of Philosophy, the Elements operated upon being Estimated according to Dr. Wollaston's Hydrogen Scale of Equivalents. Comprising Suggestions relative to Important Improvements in the Manufacture of Iron and Steel, and the Conduct of extensive Ironworks.

WITH ANALYTICAL TABLES OF IRON-MAKING MATERIALS. By SAMUEL BALDWIN ROGERS, of Nant-y-Glo, Monmouthshire. London: Mining Journal office, 25, Fleet-street.

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By JAMES ROSE, Barrister at Law, of the Inner Temple, near Bilton. London: Mining Journal office, 25, Fleet-street; and sold by all booksellers.

Notices to Correspondents.

• Much inconvenience having arisen, in consequence of several of the Numbers during the past year being out of print, we recommend that the Journal should be regularly filed on receipt: it then forms an accumulating useful work of reference.

TIN RETURNS.—We are preparing the Quarterly Returns for publication, and request all purveyors, managers, and shareholders, who feel interest therein, to supply us with all the information in their power.

LEGITIMATE SPECULATIONS.—The returning buoyancy of the money market will doubtless bring to light a long list of undertakings, each in some measure promising to outdo its predecessors in great dividends, or some other rare production. It will be no stretch of imagination, among a host of schemes that may be expected before the public gaze, to see that every article will be skillfully applied to get the "money paid in," no matter what comes after. What may we expect from the mining world? England with its numbers, showing, I hope, many good mines among them; Ireland, too, needing encouragement for the development of its treasures; bonnie Scotia with some good things; and the Cambrian Hills, no doubt, many promising ventures; while America will send us that which, according to their description, will "beat all creation." Now, Sir, ought we not to reserve some of our surplus capital for the development and working of British mines and mines in foreign possessions, in preference to Russian rails or American stocks, or any foreign country whatever, after the experience of the past? Our own stout-hearted population deserve encouragement, in the shape of honest employment; while the boundless mineral resources of British India will be open to development when it comes under imperial rule, which is to be the case. Then, we have our Australian and Cape colonies, teeming with mineral wealth; nor must we forget the islands of the Occidental Indes. Canada well deserves our attention, with a host of others, in preference to the long list of schemes from other countries, who reckon us "only valuable for our money." It will, Sir, be your judicious province, as heretofore, to weed the long list which is now almost at our birth, and for that purpose I entreat your watchful attention, so as to discourage all but "legitimate speculations."—W. B. B.: London.

GREAT WHEAL TOW UNITED.—In calling the attention of the adventurers to the heavy item of the London office in the annual expenditure, I had no other object than their interest. I said that it was about 2000*l.* a year, for I read 477*l.* for one quarter's expense; but I find that the manager's salary is included therein, which reduces the London office expense to about 1400*l.* per annum. It appears, from a correspondent in last week's Journal, that the reason for London office is the fact that the company is a London company. He says that there are no shareholders in Cornwall; in that I think he is wrong, for many gentlemen of Helston and neighbourhood took shares, which he believes, to this day. I said that the London office is a useless establishment, and that the adventurers may reside. They can hold their meetings in London without the expense of the official establishment. If the committee of investigation do not advise the abolition of this office, they will omit an important duty to the company.—AN AGENT: Camborne.

LADY BERTHA.—I understand the committee of management have determined to bring up some of the ore which is now on reserve in this mine. They say that it amounts to some thousands of tons; and if it only realises 5*l.* per ton, it will give a handsome dividend in June or September next. The calls made amount to 5000*l.*, and the ore sold has realised upwards of 4000*l.*, so that altogether nearly 10,000*l.* have been spent in developing the mine, and the shares selling at about 1*l.*, whilst in 1855, when there was only 1*l.* paid, they were fetching 2*l.* 5*s.* The mine is the richest in the district, and certainly worth the money laid out on it.—LONDON.

ASTORIA MINING COMPANY.—I was told that the liquidators had allowed Senor de Grimaldi until the end of the year to complete the contract which he had entered into with them last May. He was to have paid the second and last instalment in July; this he neglected, his object being merely to gain time. We were to have it in Sept., and then positively at the close of the year. We are now in the middle of Jan., and a conclusion of this interminable affair appears as far off as ever. If the Messrs. MacKenzie do not choose to act energetically, why do they not pursue the course that on such an occasion all honourable men would take—that is, resign the position which they are either unwilling or unable to fulfil. They should have in their possession some security for the due enforcement of the contract: let them renege it at once. It were far better that the money we have to recover was spent in litigation on their rights, than it should go to enrich the phlegmatic gains of those who made a market by buying and selling the shareholders of this ill-fated, plundered company.—R. F. M.

TAVY CONSOLS.—My reply to the imputation attempted to be fastened on myself and others concerned in the management of Tavy Consols and North Tavy Mines, by your sharp-eyed correspondent, "Argus," is that we have agreed for and marked out the course of a least, which will give us a fall of somewhere about 60 feet, perfectly independent of the water of Tavy Consols; and in planning this we look forward to the time when we shall be able to spare to the latter mine a portion of this noble stream of water on fair terms, to put it down deep enough to make a good mine yet, if the shareholders will find the means, and put confidence in their own agents, instead of listening to the twaddle of "Argus," or any other anonymous scribbler. Why do not men put their names to letters containing charges reflecting on the character and conduct of others?—EDWARD S. COOD: Plymouth.

TAVY CONSOLS.—I wish your correspondent of last week had given his real name in writing of this mine; for, while I admit that, under some circumstances, it is of little consequence whether a writer attaches his name to a document or not, I am of opinion that, when a person undertakes to cast censure on the actions of honourable men, he should not screen himself under a fabulous signature. The name "Argus" seems to prevail in various parts of the country; but whether the person bearing the name in Plymouth be the son of Astor or Agenor, or whether he be possessed of a hundred eyes, or (as some say) covered with eyes all over, I have no desire to prevent any modern Juno from placing him to watch over the actions of the managers of Tavy Consols and North Tavy Mines, and shall be glad to know that the whole of his eyes are awake; and I will promise for myself, and the gentlemen who are the managers of these mines, never to act towards "Argus" the unworthy part of Mercury, by lulling him to sleep with the sound of our flutes, or any other music. I will neither cut off his head, as wicked Mercury did that of our friend's ancestor, nor take out his eyes to adorn the tail of my peacock; and, in addition, I wish to inform "Argus" that he watches over men whose ship—"honourable intention"—will outlive every storm as surely as did the ship *Argo*, which bore Jason with his companions through every difficulty, till he had obtained possession of the golden fleece. We, the said managers, are not guided by the influence of Phineas, the blind soothsayer, as Jason was, but by the stone and mixture of Medea, which imparts to us honest intentions and honourable actions. We have outlived so many storms, that we are surprised at no new encounter; and if we were even doomed to plough the field of Mars with the fire-breathing bull of Vulcan, and sow the furrows with the serpent's teeth of Cadmus, they would produce to us armed heroes of honour, sufficient to kill "Argus," or even the dragon with which Jason had to contend for the possession of the golden fleece; which we (after all the enmity and spite manifested by "Argus," and those like him), with all those who hold fast through the peril of the "voige," shall surely take from off the "oak" at North Tavy; and the stone of Medea may yet be used to induce "Argus" and his friends to destroy one another. If, Sir, this be worth a place in your next, let it appear, and tell "Argus" that Tavy Consols is not "knocked."—R. WILLIAMS, Mining Manager of Tavy and North Tavy Mines: Tavistock.

REDUCTION OF COPPER ORES.—I was told, some two years since, by an eminent collector, now deceased, that at Tavy, near Helston (Cassell), there was about 60,000 tons of copper ore on the surface, which, by a most inexpensive process, could be reduced to metallic copper. Reservoirs, which only cost about 600*l.* to erect, could repay their original outlay in a week, and afterwards return large profits to their shareholders. In your Journal we have had the Norwegian process of Bergmeister Sinding, that of Messrs. Reid and O'Neill, &c.—are the whole of them to prove as abortive as the gold delusions? I had hoped that this species of trickery was confined solely to the precious metals, and that the more useful were not worthy the notice of the gentlemen who possess the power of projection and extraction.—G.

COPPER SMELTING.—Any attempt to form a company for this purpose I imagine will be futile; a long experience among Cornishmen has led me to know that in only one pursuit, as far as mining is concerned, are they combined—that is, "taking bail up to the gentlemen in London."—CAMBRIDGE.

JOINT-STOCK COMPANIES ACT.—"F. A." (Bath).—Insurance companies cannot be registered under this Act; but "F. A." is quite wrong in supposing that new insurance companies cannot be formed, as by the Joint-Stock Companies (1856) Amendment Act of last session (20 and 21 Vict., cap. 80) it was expressly provided that the 7 and 8 Vict., cap. 110, and the 10 and 11 Vict., cap. 78, should remain unrevoked, so far as related to insurance companies. All banking companies under 7 and 8 Vict., cap. 113, or under 9 and 10 Vict., cap. 78, are required by the "Joint-Stock Banking Companies Act, 1857," to register under that Act on or before Jan. 1, 1858; other banking companies, with more than seven partners, may come under the new Act at any future time. No banking company can be registered with limited liability. The Joint-Stock Companies Act, 1857, rather explained than amended the principal Act. "F. A." should purchase Tappin's "Exposition," from which he can obtain every information with reference to the formation of companies under the New Partnership Acts. It will be forwarded from our office on receipt of 4*s.*

WHEAL WERY CONSOLS.—"J. T." (Exeter).—A dividend of 5*s.* was declared June 16, making 2*l.* 10*s.* upon 1*l.* 9*s.* per share. The last dividend, on Dec. 22, was only 2*s.* 6*d.*, which may be accounted for by the fall in the price of ore.

PRECIOUS METAL MAKING.—Your correspondent, "Alasco," calls on me to analyse certain processes in the same manner as I did that of Gabriel Platte; but he surely forgets that Platte described his process in a concise and comprehensive way, whilst the friends of "Alasco" envelope theirs in the most profound mystery. Dealing with probabilities, I should say that Mr. Harris's invention is the application of Chevreton's *electro trieste* to an improper purpose, and that Mr. Harris has forgotten that magnets do not attract gold; that Mr. Godefray's is an attempt to employ the laboratory system of analysis, by the way, on a large scale, by introducing a little natural gas, which is a modification of the old sweating process, *a la Calvert* and predecessors, although, perhaps, without the use of electricity.—F. S.

PRECIOUS METAL MAKING.—Mr. F. Squire has stated that, if the shareholders of gold mining companies will call on him, he can render available many shares that are now valueless. I do not wish at all to enter into the merits of Mr. Squire's process: I believe that he, as well as others, can extract gold from any given specimen of quartz which contains it. In a lead of some hundreds of fathoms he cannot tell in what part the gold exists, and where the quartz is entirely denuded of the precious metal—all has to be mined and crushed, whether it be worthless or not. "Gold may be bought too dear." Let us first be satisfied that, contrary to all hitherto acquired experience, the auriferous particles are uniformly diffused through the vein, instead of being detached some hundreds of fathoms from each other. Then the question may arise whether it will be of any utility to reduce thousands of tons of ore to obtain the little quantity of gold they contain, due regard being paid to the cost of mining and crushing which must necessarily ensue, especially in countries where wages are high and labour scarce.—COMMON SENSE.

DARTMOOR, No. II. shall appear in next week's Journal.

TREASURER MINE.—If your readers will refer to the fifth volume of the Cornwall Geological Society's "Transactions" (p. 88), they will find that many of the details respecting Treasur, which appeared in your last Journal, as well as others which have no place there, were published as long since as 1845.—AN OLD CORRESPONDENT.

[Some interesting particulars respecting the Treasur Mine, including a return of the dividends declared from 1828 to 1847 (equal to 4680*l.* 13*s.* per 90th share), also appeared in our Journal of Jan. 11, 1851, and should be consulted by those desirous of information on the subject.]

MANGANESE.—If your correspondents who are requiring manganese would state the quality required, and the price per ton on which they would be willing to give, I think the Newfoundland Mining Association, 36, Booth-street, Manchester, can supply any quantity.—G.

PENDEN CONSOLS.—A correspondent, in your last Journal, in reply to "A Small Capitalist," gives an erroneous statement of the geographical position of this mine, whether ignorantly or designedly, I cannot tell. He says, "The rich dividend-paying mines of Bottalack and Levant are on either side, Penden Consols being the centre." Such a statement is calculated to induce an over-confidence in the mine, and should be corrected. I find, from a neatly-executed plan of the district, by Mr. R. Symonds, surveyor, Truro, that Penden Consols adjoins neither Bottalack nor Levant. Going northward, the mines stand in the following order:—Bottalack, Spearhead Moor, Levant, North Levant, Boscawell, Boscawell Downs, Penden Consols.—AN AGENT: Camborne.

WEST WHEAL JANE.—"A Subscriber."—This mine is divided into 10,000 shares, and commenced working with a capital of 10,000*l.*, raised in four instalments of 2*l.* each. The amount of calls (the fifteen in number) from the commencement of the undertaking have amounted to 2*l.* 10*s.* 6*d.*, and the present price is about 10*s.* The price in the beginning of 1844 ranged from 2*l.* to 3*l.*, which arose from the gold mania. The prospects at present may be considered good, the adjoining mine, Wheal Jane, having returned large profits, considering the outlay.

MINERAL WEALTH OF NEWFOUNDLAND.—In the information on this subject, in last week's Journal, the English Ridge Mine was described as *Mineral Ridge* Mine. In our next, we expect to publish a sketch, from original notes, relative to the general features of the colony.

CARBONS CREEK MINING COMPANY.—A shareholder enquires what has become of the remaining sum which the directors promised to return. I made some enquiries at the office regarding this matter, when I was told by Mr. H. Nesbitt, the secretary, that the money had been deposited with the Chairman on interest, he having given securities for the amount so entrusted to him. That Chairman was John Sadler, Esq. After his suicide, the securities were found to be worthless, and consequently the Carbons Creek shareholders lost the deposit that should have been returned to them.—T. B. F.

WHEAL KITTY (St. Agnes).—"K." (Old Broad-street).—We are unable to give a full report of this meeting, as our reporter was refused admission, and it is the only company conducted in this otherwise well-regulated office of which the proceedings are not fully detailed in our columns. It is said to be through a certain party who, although receiving pecuniary benefit from illumination, prefers darkness to light.

PATENT LAW.—I often read the remarks on this subject in your Journal. I notice last week Mr. F. W. Campin defends the principle of protecting the rights of people who resuscitate old inventions, if I may so use the term, which in the majority of instances have been tried and found abortive. Before any one attempts to bring any improvement before the world he ought to have investigated the matter thoroughly, and have ascertained what others have done before him. Were this the case, we should not have so many crude inventions, one-half of which are merely the emanations of diseased brains; while a considerable portion are merely patented for the purpose of extracting money from the gaping multitude. The patent agents would do good service, not only to their clients but the world in general, if they would advise these gentry to ascertain whether many of their lucubrations are not already before the public, and to see what success they have met with. At present every man who has what he thinks a new idea can get it patented, whether it be novel or not. This often only leads to an endless source of litigation, and a fruitless expenditure of money.—CARRERS.

SOUTH HUNGTON TIN MINE, CALISTOCK.—I perceive by your valuable Journal that this mine is stated to be divided into 900 shares; 2*l.* paid; present price 3*l.* 10*s.* Can you inform me whether they have any office in London or on the mine; or whether, in fact, any operations are being carried on?—AN OLD SUBSCRIBER.

CLIFAN AND WENTWORTH.—A few weeks ago, I adverted to the high charge made for the plan of this mine—21*l.* I have since had a conversation with a surveyor, who can do the work in every respect as well as that is done, and he informs me that 5*l.* or 6*l.* is the usual charge, and that he would not have been charged more if he had undertaken the work without any agreement as to price. It is wrong both to charge and to pay such an exorbitant sum. Who is the manager?—AGENT.

WHEAL VYVYAN (Constantine).—Mr. Watson must have been misinformed respecting this mine, as the last workers, alluded to by him, not only made no profit, but ruined themselves. I was on the mine a few days since, and ascertained the fact from one of the sufferers. As some future parties may make use of Mr. Watson's quotation (which I am quite sure has been done through error), it is right that the public should be correctly informed. Anyone desirous of doing so, has only to apply to Capt. Burgess, Helston, or to J. Collins, Constantine, to prove the accuracy of this assertion. Mr. Watson deserves the thanks of every Cornishman for the pains he has taken, and the care and correctness displayed generally. Though he has inadvertently omitted many extensive and important mines: this is, perhaps, owing as much as anything to the apathy of the captains; but a little energy on the part of Messrs. Watson would soon rectify this.—CORRESPONDENT.

THE MINING JOURNAL. Railway and Commercial Gazette.

LONDON, JANUARY 16, 1858.

"After a storm comes a calm," is true in a figurative as well as a physical application. The experienced seaman, or attentive student of nature, watches the barometer with intense care, and the cautious observer of the times regards with equally sensitive feelings the signs therein to be read of the indications of an approaching storm, which by casual observers would be wholly unheeded or disregarded. When a terrible storm shall have passed away, causing the most disastrous wrecks and delapidations, these wary parties do not sit wringing their hands, and weeping and lamenting their misfortunes, but philosophically and wisely set about making the best of their time during the succeeding calm, repairing that which may be damaged, replacing, if possible, that destroyed, and reaping any advantage that may offer itself.

A little attention to this subject should teach us to profit by the devastating tempest through which the commercial interests of this great country have lately passed (we say passed, for we trust and believe the crisis is over, and confidence reviving), and to take advantage of the advent of a "good time coming," not to reflect on the gloomy past, but hail with joy that prosperity which is evidently near at hand; the mere fact of doing so will, as much as anything, hasten its accomplishment.

Let us, however, take a retrospect of the mining interests during the

late period of extreme trial, and see how the mining world withstood the shock of the typhoon which has so shaken commerce generally, and we shall find less cause for complaint, and less actual loss, than in any other class of speculative property whatever. Though the prices of metals have seriously declined, and their ore correspondingly reduced in value, yet the mines themselves, *de facto*, have not been permanently injured. Discouraged and crippled for a time the miner certainly has been, but he knows and feels he is ultimately secure, that he has the silent but sure processes of Nature, the *tempus edax rerum*, for his safeguard; that whether the commercial world suffer weal or woe his products are being consumed, and must be replaced; that tin will rust and copper decay, coals must and will be consumed, earthenware will break, and mankind will multiply. He feels assured that when the storm shall have passed over sunshine will succeed, when his services will as certainly be again called into requisition. He, therefore, has only to bide his time, and prepare for that increasing demand which must arise from the inanition of the period, and the consequent reaction. He, therefore, should not relax one whit of his endeavours to prosecute discovery, confirm his suppositions by practical development, and prepare to meet that supply he will most decidedly be called upon to furnish.

The fall that has taken place in the prices of shares in mining undertakings is in some instances very considerable; in many, unworthy and "simply ludicrous"; in all, only caused by panic. It must be remembered that "a share" is not mining; that many persons were compelled by the force of circumstances to sell such properties as would fetch money at any sacrifice, hence in a great measure the decline. We are assured, on the best and most reliable authorities, that the mines themselves, as a whole, never looked better, that when an improved market shall have been obtained they will return to that state of eminent prosperity they so lately enjoyed, and that there is no reason whatever to repine or to fear.

It, therefore, becomes our duty and pleasure to remind our friends that now is the time to repair damages, by purchasing stocks of the various metals, particularly tin and copper, at the present reduced rates, as it may be depended on they cannot go lower, for if the quotations were to decline they could not be produced, and would instantly cause a reaction; that already there are indications of an improvement, money is becoming cheaper, trade reviving, and the standard improving. To capitalists we address ourselves, and advise the purchase of sound stocks at present prices, as a sure and safe investment, which will pay them better, by way of interest or of speculative purchase, than any other property. In both cases action, immediate action, is safe, and we beg to remind them that to be forewarned is to be forearmed, and request them to well ponder the maxim.

Having stated that we do not consider ourselves justified in devoting any further space to the discussion of Mr. MURCHISON'S methods of making steel, &c., until we may be in possession of facts such as have been pointed out to be necessary for settling this question, we must refrain from offering any reply to the remarks contained in his letter, which appears in this week's Journal as an advertisement. To those of our readers who may be interested in this subject, the merits of Mr. MURCHISON'S remarks will be self-evident, and we refer to the articles that have appeared in our columns as proof that there was every desire to do him full justice. We have borne testimony to the excellence of the steel sent to our office by Mr. MURCHISON; we have even admitted Mr. MURCHISON'S first proposition, that by the method he adopted he has made good steel; but guided by the light of recorded facts, we felt compelled to point out that Mr. MURCHISON'S account of that method was inconsistent with what is known with regard to the connection between the qualities of steel and its composition, and to other points in the chemistry of iron metallurgy. We do not lay claim to the merit of having discovered the chemical data, or propounded the opinions that we have shown to be opposed to Mr. MURCHISON'S views. Nor are they put forward for the purpose of being blindly believed, without the possibility of testing their antecedents and title to acceptance; these may be found in any work treating of the subject. We have also admitted that Mr. MURCHISON may be in possession of knowledge that will put to confusion the received opinions, both metallurgical and chemical, in which we have hitherto trusted; that, indeed, he may be the herald of a new creed in these matters, and we, as free thinkers in this case, have urged upon him not to "hide his light under a bushel," but to let it come forth to the confusion of heretics and "unscrupulous men." We feel convinced that any man who can make good steel from average British coke pig-iron need not remain in a "false position" unwillingly; no combination, no influence could crush him, and we could wish no better cause to defend than that of such an inventor. Mr. MURCHISON must, however, remember that it is not our business to furnish evidence of the reality and effectiveness of his invention, for convincing those who disbelieve in it. Nor can we accept his invitation to witness his operations, since that would not furnish the kind of proof we have already shown to be requisite. To furnish such proof would be an affair of such simplicity, that we can only express our surprise that Mr. MURCHISON should not long since have removed the cloud that has been gathering around him and his methods, and have freed himself from the "false position" over which he laments so loudly.

But Mr. MURCHISON seems to prefer a self-imposed martyrdom, varied with the excitement of controversy and denunciation. The continuation of this in our columns, we apprehend, would not be either advantageous to him or edifying to our readers; and, therefore, after having stated the case as fairly as we were able to do, and pointed out what we thought was requisite from Mr. MURCHISON, it seemed advisable to withdraw from useless discussion, and to wait the appearance of positive data. That we have not misrepresented the views of chemists in commenting upon Mr. MURCHISON'S method, he may very readily ascertain, by comparing our statements with any elementary treatise on chemistry; and without requiring to involve himself in the complexities of the atomic theory, or any other chemical theory, but by simply referring to chemical facts, he will find the grounds upon which those views and statements are based. By this means he may learn that *soda* is not *sodium*; he will find all that is taught about carburet of manganese and carburet of iron; he will discover why ores of iron are not at once plunged into the melting heat, as well as information answering his other queries. This, we have no doubt, he will find novel, if not interesting.

We would draw the attention of our readers to Mr. MURCHISON'S Review of British Mining for the Quarter and the Year ending Dec. 31, 1857, published this day, and a long extract from which appears in another column. It will be seen that there is still an increase in the dividends paid over previous years, and that for the whole year the average price per ton given for the copper ores of Cornwall and Devon is higher than that given in 1856, notwithstanding the average produce is lower. It then appears that the mines have yielded in 1857 about 150,000*l.* worth of fine copper less than in 1856, and about 43,000*l.* worth less than in the year 1855, facts tending to keep up the price, seeing that the exportations of British copper have increased, while the exportations of foreign copper have also increased almost in proportion to the importations. The prospects to the miner are, therefore, encouraging, and as the returns have fallen off considerably from some of the older and larger concerns, the younger mines will doubtless derive considerable benefit from the firmness and probable advance of prices. There is an increase in the dividends paid by tin mines, from the very high price of that metal during a considerable portion of the year; while the lead mines, which paid 75 per cent. of the total increase in 1856, are again larger. The reduction in wages and materials will be of advantage, particularly while the metals remain so low as at present. Mr. MURCHISON refers to the nature of the constitution of mining companies, and shows very clearly the difference between cost-book companies and companies under the new Joint-Stock Act. We would earnestly solicit shareholders to peruse his remarks, which are of the utmost importance to all. In this Review the author has entered more fully than usual into the position and prospects of the principal dividend and progressive mines, giving such information as may be useful to those interested, or disposed to embark, in this class of investment.

We cannot conclude these brief observations without referring to the great good which Mr. MURCHISON'S publications have done for the mining interest. They have drawn attention in a legitimate way to the *bona fide* undertakings, and shown how successful such concerns generally become where carried out under honest management, and spiritedly persevered with. Want of sufficient capital has hitherto been the chief cause of abandonments, and it is well known that most of the best mines have been successively in the hands of several companies before coming into a profitable state. We have noticed that in the last three or four years there has been much more perseverance among those engaged in working young mines, and we could point to several which, after working for years, have lately made good discoveries, the shares in which were almost unsaleable

not long ago, but now in good demand, and the returns likely soon to be yielding profits. The great feature of these Reviews is their practical character, and the clearness and ability with which they are written.

The reaction which we anticipated, as the consequence of the high price of money, which has so much affected all commercial transactions, has been much more rapid than was generally expected. Another reduction in the rates of discount was declared by the Bank of England on Thursday last, and the minimum stands now at 5 per cent., for the first time for nearly a year and a half. It is believed in well-informed quarters that a still further reduction will take place before long, as all appearances indicate that the gold in hand, and the steady increase of which has led to the present relaxation, will continue to accumulate, further arrivals being expected from various quarters. A corresponding reduction of 1 per cent. has also been made by the joint-stock banks and discount houses in the rate of interest allowed on deposits, while the London and Westminster Bank has reduced the rate allowed to 3 per cent. on sums of 5000. and upwards, and to 2 per cent. on lesser amounts at call. How beneficially the relief thus afforded must operate on trade and commerce generally is very evident. Depositors who were content, and not unreasonably, with the liberal interest paid by the banks for some time back, will seek new channels of investment, and look with favour upon enterprises that were a few weeks ago wholly disregarded.

Now that the crisis is virtually past the attention of the financial world will be naturally directed to the enquiry which the meeting of Parliament will inaugurate, into the causes of the late serious monetary difficulties. The position of the joint-stock banks, in relation to their shareholders, their depositors and the public, will, we believe, from the tendency of recent strictures which have engaged public attention, occupy the consideration of the Legislature.

We have before us a very opportune publication by Mr. JAS. KNIGHT, embracing a lucid analysis of the progress, resources, and constitution of the London joint-stock banks; which, besides the periodical statements of these institutions from their earliest dates, notices succinctly the question of the substitution of "limited," in place of "unlimited," liability; also the regulation of the amount of capital to be paid-up; the increase of paid-up capital, in proportion to the increase of depositors, or liabilities to the public, with other details which at this moment possess peculiar interest. We commend Mr. Knight's pamphlet to the perusal of those who wish to be informed on a most important subject, and shall avail ourselves of its contents in returning to the consideration of the institutions to which it refers.

Our contemporary, the *Daily News*, seems to have raised a commotion, both in the North and West, by the articles that have recently appeared in that paper on the kind of coal suitable for steam navigation. The object of these articles is to prove that the reports furnished to the Government on this subject by Dr. LYON PLAYFAIR, while chemist to the School of Mines, and under the direction of the late Sir HENRY DE LA BECHE, are valueless, inasmuch as they are stated to be based upon erroneous assumptions, and supported by imperfect experiments made with defective apparatus. Singularly enough, this charge is in the main admitted by Dr. PLAYFAIR; and still more remarkably, he offers as an excuse the occupation of his time by other official duties, and the consequent necessity of leaving the execution of the experiments to assistants. If we remember correctly, this was the first and the only attempt that has been made by the officers of the School of Mines to furnish scientific information on practical subjects. The undertaking was also supported by liberal grants of public money, as well as by private liberality; and from the fact that the reports were very soon out of print, it may be inferred that some value was attached to the investigation. Under these circumstances it is certainly not calculated to inspire much confidence or hope in the proceedings of this department, to find that an investigation, apparently so elaborate, and carried out under circumstances so favourable for rendering it trustworthy and complete, should be liable to question, even in minor details.

As it is, the whole question of fuel for steam navigation seems to be again rendered an open one, excepting so far as practice may in the mean time have decided what, it would appear, our scientific men have failed to do. The writer of the articles in the *Daily News* seems to have a latent bias in favour of "north country" coals, as preferable to Welsh coal for steam navigation.

The consideration of the question between the two involves points for and against both sides, and we purpose offering some observations on the subject shortly. It may, however, be remarked that the term "Welsh coal" is extremely vague, including not only differences of quality, but of kind, and that in order to avoid as much as possible the odium of invidiousness in making a comparison, it is highly desirable that the things to be compared should be clearly defined before giving the preference.

MERCURY MINES OF NEW ALMADEN, CALIFORNIA.—The Californian mercury mines are situated in the Santa Clara district, 12 miles from the town of San José, which again is 54 miles from San Francisco. The mercury ore was discovered in 1843, by Capt. Castellero, who, observing that one of the native Indians painted himself red with cinnabar, but kept the source of the pigment secret, followed him secretly, and found the place where he collected it. The working of the ore was commenced in 1846, by an English company, whose operations were not profitable. In 1849 it fell into American hands, and at the present time 30,000 bottles of mercury are obtained annually. The mine is entered by a horizontal gallery, extending 1200 ft. into the rock, with lateral galleries 7 or 8 ft. diameter, where the cinnabar is dug; one of these lateral workings already extends 400 ft. In the main gallery there is a tram-way. The miners are native Mexicans. The ore is raised with picks, shot into sacks made of skins, loaded upon the trucks, and removed from the mine to be sorted. The richer ore is separated in lumps of 20 or 30 lbs., and sent in wagons, about a mile and a quarter down the mountain, to the smelting works. The smaller fragments, mixed with yellowish loamy ore, are kneaded with water, and formed into bricks, *adobes*, which are dried in the sun, and then worked in the same way as the larger masses of ore. The apparatus for smelting the ore is very simple; it consists of a kind of reverberatory furnace, 3 to 5 ft. high, and communicating with a row of eight or ten chambers, 8 ft. long, 4 ft. broad, and 5 ft. high; these chambers are built of bricks, held together with iron bolts; at the top, each chamber is closed by cast-iron plates, luted with salt and ashes. The furnace is heated with wood, and is connected, by means of a network of bricks, with the ore chamber. The flame of the fire strikes through the angular channels of this network into the ore chamber, charged with 10,000 lbs. of cinnabar. Connected with this, by means of a square flue passing upwards, is the first condensation chamber, which is connected with the next by a similar flue, and so on with the rest, the flues being alternately ascending and descending, the apertures in the chambers being placed alternately at the top to the right-hand, and at the bottom to the left-hand, so that the vapour from the ore chamber is forced to pass in a spiral course through the eight condensation chambers, from the latter of which smoke and vapour issue through a four-sided wooden tank, in which a stream of cold water constantly circulates, and lastly they escape by a long wooden chimney. The floor of each condensation chamber is about 2 ft. above the lower end, and contains troughs for receiving the condensed mercury, and transferring it to an open tube, terminating in an iron vessel, from which the mercury is poured into iron bottles by means of a brush, which retains all impurities. There are fourteen such furnaces and condensation arrangements, at a distance of 8 or 10 ft. apart; the whole are under cover of a roof, high enough to admit a free current of air. The time requisite for working a charge of ore, 10,000 lbs., is 60 hours; the fire is regulated, so as to give a uniform red-heat. On account of the volatility of mercury, it is found impossible to prevent some waste, both from the chimney and the joints of the apparatus. The roofs all round are covered with a black deposit, consisting of metallic mercury, very finely divided. The soot of the chimney contains a sensible amount of the metal, the globules being recognisable with a magnifying glass. The pores of the stone with which the condensation chambers are built soon become filled with mercury, and yield a considerable amount when treated in the same way as the ore in the ore chamber of the furnace. Mr. Kusenberger, who has described these mines and works, states that on examining the water tank belonging to one of these series, he observed that its sides were coated with a layer of mercury, about an eighth of an inch thick, and which, when rubbed with the finger, collected into globules and fell to the bottom of the water. It would appear, therefore, that this mercury had been condensed by the water from the vapour, before entering the chimney. The surplus water passes into a covered trough, about 50 yards long and 4 inches wide, and then runs down the hill. This trough was also found to be lined with a similar black

deposit of finely divided metallic mercury. The labourers and animals employed at the smelting works are subject to salivation and other effects of mercury, while those employed at the mines are entirely free from any of these diseases.

ON THE LONDON SEWERAGE.

The drainage of the metropolis and the dealing with the sewerage has now engaged the attention of many of the first engineers, chemists, and philosophers of our times—gigantic schemes have been originated, discussed, and rejected—commissioners, engineers, and schemers have rapidly succeeded each other, but still nothing is done.

It is made a *sine qua non* that no sewage is to pass into the Thames, because it is assumed to adulterate its waters *ad nauseam*, whilst it deposits upon its shores successive layers of putrid mud, which seems to invite intermitting diseases of the most dangerous kinds, whilst it produces a constant succession of nuisances to the smell of the inhabitants.

I confess that I am one of the few who think that many of these evils may be alleviated by the provision of unlimited supplies of water for the cleansing of the present sewers, and, with additional measures, that the evil may be so modified as to cease to be that gigantic nuisance which it has hitherto assumed; for it is a strange and important fact that in the lower parts of the river and pool the water is sufficiently pure as to fill the drinking casks of vessels of every description, and we do not understand that such water engenders disease, or is in the least degree unwholesome. Professors Hofmann and W. Witt have prosecuted most voluminous experiments upon the nature of the sewer and Thames waters, and of the capability of deodorising or converting them into manure, &c.; but all their experiments fail to show that any practical result can be anticipated, otherwise than in the adulteration of the river, and that the only cure is the stupendous scheme of carrying the sewerage away towards the ocean—a process which is beset with so much difficulty and dreadful expenditure, that it is not to be wondered at that so many and such varied opinions have been, and will be, broached upon it.

My attention, therefore, has been directed to a process easy in expenditure, and containing plain and practical grounds, if not for an absolute cure, at least for a speedy and certain alleviation of the evils. Messrs. Hofmann and Witt give an analysis of the percentage of organic matter contained in the mud at different points in the river's course at flood tide:—

Hammersmith	16.91
Wandsworth Lock	21.32
Westminster Bridge (high water)	22.14
London Bridge (ditto)	maximum 27.69
Victoria Dock (ditto)	15.88
Rainham Creek (ditto)	17.22

The table shows that the maximum is at London Bridge, and the proportion of organic matter in the mud steadily declining in either direction proves that a larger quantity of organic matter rests where the London sewers empty themselves into the river.

These gentlemen attribute the most mischievous consequences to the deposit of black sewage mud—in those parts of the river containing the greatest surface—which enormously increase the intensity of the process of putrefaction, and consequently multiply the quantity of offensive emanations to an intolerable and dangerous degree.

The mean amount of organic matter contained in the specimens of river water was equal to about 3-4ths of the amount of organic matter contained in the Earl-street sewer, and that the mineral matter in the river water was half that in the sewer, and that, as compared with the Fleet sewer, the quantity of organic matter in the river was as 1 to 8 in the sewer. The total impurity of the river to the total impurity of the sewer being as 1 to 2.6. The great perniciousness being its peculiar liability to putrify, which tendency is considerably increased by the agitation occasioned by steam boats, &c. Messrs. Hofmann and Witt emphatically insist that the formation of this mud deposit in the river appears by far the most serious evil which results from the discharge of the London sewage into the river. They say, "We cannot too strongly urge this point upon public attention."

Taking it for granted, then, that the deposit of sewage upon the shores of the river forms the greatest and most dangerous element in the question, I advert to my often-communicated device of neutralising the contents of the sewers with unlimited admixtures of water successively applied during the ebb tide; and the reporters, Messrs. Galton, Simpson, and Blackwell, have honoured my scheme submitted to them in the following words:—"Matthews Dunn proposes to obtain an unlimited supply of water by sinking a shaft, in some commanding position, to the level of the River Thames, between which and the shaft a tunnel should be made, and the mouth of the tunnel to receive the water at half-tide.—Proposes, by means of a powerful steam engine, to raise the water and flush the sewers during the time of ebb tide."

The principal object in the above was the ready and cheap application of the existing sewers, and with the impression that the foul waters put into the river stream during the ebb would gradually wear away to the ocean.

Since the publication of the voluminous report of Messrs. Galton, Simpson, and Blackwell I have scrutinised the subject more deeply as to the grounds of my formerly expressed opinions; and with this view I have ascertained the degree of water-way in the River Thames at various points, and especially at the bridges, which I find to be as follows:—

1. At the Penitentiary	Water-way (feet)	660
2. Westminster Bridge		820
3. Hungerford Bridge		1485
4. Waterloo Bridge		1080
5. Temple Gardens		1320
6. Blackfriars Bridge		790
7. Southwark Bridge		660
8. London Bridge		692

The *Pictorial Handbook of London*, published in 1854, contains some very appropriate and corroboratory statements relative to the prejudicial effect of the unequal widths of the river and water-way:—

At the ebb tide, the respective velocities of the tidal wave are stated as follows:—

From Westminster Bridge to Waterloo Bridge	2.27
Waterloo to Blackfriars	2.854
Blackfriars to Southwark	3.70
Southwark to London	3.903

The areas of different portions of the river at high-water, at the following points between the above limits, being—

Whitehall	Superficial feet	23,500
Hungerford Market		22,000
Waterloo Bridge		21,000
Opposite Bouvierie-street		18,000
Southwark Bridge		17,000
London Bridge		17,600

The irregularity of the area fully accounts for the formation of the loathsome beds of mud which disfigure the river at low tide, and demonstrates painfully the defective state of the regulations connected with the formation and maintenance of the course of the river. The velocity of the tidal wave from the North Foreland to London is about 50 miles per hour; above the bridges, from the resistance it meets with the velocity is reduced to 12 miles per hour on the average. The difference of time of high water between London Bridge and Richmond is 1 hour 18 minutes. The same resistance affects the duration of its rise:—

At London Bridge, the flood tide runs	5 hours.
ditto the ebb tide	7 ditto
Putney Bridge—flood	4 ditto
Richmond	3 ditto
Teddington	1 1/2 ditto
Rise of tide at Deptford—spring	19 ft. 2 in.
ditto neap	13 3
ditto London Docks—spring	18 0
ditto Putney	10 2

EXTRANEOUS MATTER IN SUSPENSION IN THE THAMES WATER.—Dr. Bostock, in 1828, estimated the proportion of solid matter in suspension at 1-5000th part of the weight. At Richmond, the Thames is as foul as in the heart of the river. (Parliamentary Committee of 1848.) The organic matter varying from Westminster Bridge upwards between 0.85 and 1.43 grains to the gallon. The amount of dissolved matter not being very perceptibly greater at London or Westminster Bridge, where the water looks so dirty, than at Kingston, Kew, or Richmond, where it is so beautifully clear.

Now, under the above statements, how can it be otherwise than that those parts of the river in which the greatest discharge of sewage takes place are those parts in which the current is the most sluggish and ineffective; consequently, the deposit becomes the most excessive, and that, too, in the very heart of the metropolis.

And this basis being once admitted, it leads inevitably to the conclusion that a contraction and equalisation of the tidal current would, without doubt, greatly reduce the action of deposit, and, of course, diminish the evil so strongly set forth in the reports of Messrs. Hofmann and Witt, and adopted by the reporters appointed by the Chief Commissioner.

To adopt, therefore, my notion of improvement, instead of being extraordinarily expensive it would, on the contrary, be vastly profitable, whilst

it could be carried out with definite and calculable speed and cost. It would consist of a quay to be extended from Westminster Bridge to Southwark Bridge, upon the south side of the river, beginning and ending at a point, and swelling out to the centre, conforming with the opposite shore, and equalising the area with that of Blackfriars Bridge. Without going into detail, this enclosure would form a most valuable property, whilst it would leave the crowded state of the buildings and wharfs upon the north side of the Thames untouched, but comparatively void of the dreadful pestilence which now appertains to the deposit of sewage stuff.

I am, of course, aware that the popular clamour runs upon gigantic sewers, to convey the nuisances away to the ocean direct. I cannot shut my eyes to the perpetual discord that has prevailed upon the subject during the last ten years, during which nothing has been done; and I share the opinion of many able men, who conceive that the projected grand schemes now before the public will be found so difficult and expensive, that they will also undergo such great and progressive changes and alterations, that a generation will pass away before their completion; whilst by adopting moderate and practical measures the evil may be promptly ameliorated, at a rational and moderate cost.

MATTHIAS DUNN,
Government Mine Inspector.

Since writing the above, I have perused some remarks upon the "Sewage of London," read before the Society of Arts, by Mr. Henry Allnutt. The principal point urged by Mr. Allnutt seems to be the separation of the sewage from the storm and other waters, with statistical calculations as to the amount of rain fall, &c., over the varying areas assumed by Mr. Bazalgette and other engineers. Into these calculations I will not presume to enter; but I concur with Mr. Allnutt in his representation of the innumerable pipes, gas, water, &c., that cannot fail to present great and fatal difficulties to the progress of the gigantic sewers now in contemplation. For instance, in Parliament-street alone there are 18 pipes, 12 of which number are gas-pipes, 4 water-pipes, 1 for the telegraph, and 1 drain, beside the sewer. The Chartered Gas Company own 5 pipes, the Equitable 3, the London 3, and the East Gas Company 1. In Bridge-street there are 16 pipes; and at Charing Cross there are upwards of 30 gas and water-pipes. Such being the case already, it does but fortify one in the opinion that the difficulty of carrying out the grand sewer system now projected will be found insuperable.

As to the rate of fall proposed, I see that the late Mr. Frank Forster, with the approbation of the London Metropolitan Commissioners, and distinguished engineers of eminence, adopted a fall of 4 1/2 feet per mile, the whole sewage to be delivered into the Thames eight miles below London; and to cleanse the sewers of gas by adopting my suggestions of high chimneys. The present engineers propose 6 inches for the fall, leaving a wide margin for professional theory.

M. D.

THE MINING AND INDUSTRIAL INTERESTS OF CORNWALL.

[FROM OUR CORRESPONDENT IN WEST CORNWALL.]

JAN. 14.—The copper standard last week slightly receded, as compared with the preceding week, but showed an advance of 2 1/2 s., as compared with the standard in the corresponding week of December. Though the prices of metals are at present low, mining shareholders are looking forward with much confidence to an improved state of things in the spring of the year; and, in consequence, the shares in many mines are assuming an upward tendency. It is remarked by some of the older agents and adventurers in copper mines, that it is only of late years, since the expansion of trade consequent on free-trade measures and the increased construction of machinery, &c., that the price of fine copper, and the standard for copper ore, have gone up to so high a figure, in comparison with former years. The miners have undoubtedly benefited considerably by the great increase of trade, and the large consumption of copper within this recent period; and the smelters have taken care to benefit still more than the miners. The high prices of copper and copper ores commenced about five years ago: before that time, for many years, prices were very low, and the standard lower than it is now, or has been during the commercial crisis which has now passed over. A few figures will make this statement very plain, taking the first sale in January for a series of years:

Years.	Standard.	Produce.	Ore copper.	Cake copper.
1818	£99 1	8 1/2	£55 11	£28 10
1819	91 3	7 3/4	55 3	29 10
1820	109 5	7 1/2	70 17	61 0
1821	119 10	6 3/4	70 0	84 0
1822	105 9	7 3/4	70 2	88 10
1823	123 3	7 1/2	84 8	107 10

It will be seen from the above, that in Jan., 1852, and several years previously, the standard and the price of fine copper were much lower than they were last week, notwithstanding the depression of trade and the disastrous monetary circumstances with which the nation has been recently visited. Some persons may, then, ask, why should not the mines be in better circumstances now than they were in from 1848 to 1852? It may be replied, that the price of labour of late years has considerably advanced. The pursuer who wrote from Wendron in Nov. last, and proposed a meeting of the pursers of tin mines, remarked that the labour market had been in a very unsound state for some years. "Emigration," he said, "has deprived us of our best men, and from a want of concord between employers, prices have been given which were not justified." It is a notorious fact, that not only has the price of labour been advancing for some years, but the cost of materials has been very high. Now, however, these circumstances have altered. There are at the present time more second-hand materials in the country for sale than there have been for a long period; and reductions have taken place in wages, throughout the country, ranging from 15 to 20 per cent. This will make a very considerable difference in the labour costs of mines; and, on the whole, it does not appear that the mining interest can be in a worse position, even with the present standard, than it was in from 1848 to 1852, to which years the above figures refer. The five years of prosperity since 1852 rendered the mining interest very discontented and impatient when compelled to submit to the low standards which the monetary crisis imposed. But, although the smelters occasioned great dissatisfaction by reducing the standard week after week, whilst they kept up the price of copper to 12 1/2 10s. per ton, it must be allowed that their trade was very disastrously affected by the commercial difficulties of the times, and that a reduction of the standard to a considerable extent was only a necessary consequence of the stagnation of trade. Whether they reduced the standard unduly, in order to keep up their profits when every one else has to sacrifice somewhat, is a question on which many mine adventurers hold a strong opinion. The monetary crisis, however, has now passed over. The accounts from America are very encouraging; trade in our own country is looking better; money is becoming cheaper every week, and the mining market has already considerably improved. A rise in the prices of metals will naturally take place in consequence of the improved state of things; and the mining interest, it is confidently believed, will have a prosperous period in the course of the present year.

There have been many enquiries for shares this week, and the local market has become much more animated. East Basset is looking well, and holders are firm. North Frances has a very promising lode in the 36 west, and shares have advanced. South Tolgus shares have gone up considerably in consequence of the improved appearance of the mine. Tolgus is doing well, and shares likely to go higher. Cargill has much improved, and shares have gone up 5s. or 6s. West Basset is looking very well in the bottom of the mine. Prices have also improved in Wheal Basset. There is a very good report of West Alfred Consols, which is opening up well. In the tin mines there is not much doing, because of the low price of tin, and the expectation that this metal will not go up so soon as the copper standard, on account of the stocks to be first cleared off the market. The fall in tin at the present time, as compared with March, 1857, amounts to about 24s. per ton on the average of black tin. St. Ives Consols is looking remarkably well. Wheal Margery is stated to have improved. Pendennis continues to look very encouraging; and North Levant presents indications of a good mine. Wendron Consols is looking well, and this and other tin mines will be in a good position in the course of the year.

At the Quarter Sessions, held last week at Bodmin, three miners were indicted for what is locally called "kitting," or stealing ore from another part of a mine to add to the value of the produce of their own pitches. The three miners charged were Thomas Cook, James Davey, and Francis Teague; they worked in Great South Tolgus Mine, and the offence was committed in September last. In the 70, near the shaft, were two pitches, one of which was taken by Davey and Teague, at 12s. in 17, and the other was taken by Cook and Middleton (the latter having since gone to Australia), at 10s. in 17. In Sept., when the two-monthly "take" had expired, the captain was surprised to find that these two pairs of men claimed tribute on a large quantity of rich yellow ore, said to have been broken in their pitches, where the tributes were high through the lode being poor.

THE MINERS' FRIENDS—No. I.

BICKFORD'S SAFETY-FUSE—COPELAND'S PATENT CARTRIDGE.

A celebrated political economist says, "He who makes two blades of grass grow where only one was previously produced, is a true patriot." Why should not this noble distinction be awarded to those who, by their ingenuity and talents, render the dangerous employment of the miner comparatively safe? Is he not a true patriot who preserves human life; who reduces the chance of accident to the exception and not the rule; who by thus reducing the danger cheapens the expense at which the minerals may be procured, and thus adds to the general weal? All honour to such men! let them profit by their inventions, and let the fame thereof be, as they deserve to be, world-wide!

These reflections were induced on considering the facilities for blasting underground at the present day, and the crude, difficult methods in general use thirty or forty years since. Strange and improbable as it may appear, we actually, on a late occasion, saw the rush and greased paper bag still in use, and this circumstance riveted the attention we had previously given the subject. The manifold advantages (proved beyond doubt or cavil) of Bickford's fuse we should have supposed would have rendered the primitive rush obsolete, particularly when the cost is so trivial. In wet mines even now prejudice and old associations prevent the should-be universal introduction of Copeland's cartridges. We have for many years borne ample testimony and experience of the intrinsic and immense value of the former; of the latter we were only imperfectly advised. On a late occasion, therefore, as we were passing the magazine of a mine, observing a large heap of the cartridges, we were curious to know how they were approved of by the miners. Be it remembered, the mine is one of the wettest holes in Cornwall, and firing shots most difficult. The captain assured me they were most excellent things. "They, and the fuse, Sir, are the making of this mine; we could hardly work it without them. The only fault the men complain of is the price. But then, I suppose, that is made up; as the powder in Mr. Copeland's cartridges is far stronger than our common blasting powder, and they are ten times safer. I don't know of any one ever having missed firing in our mine; and besides, it saves time, and saves powder. There's no digging out of holes, or dangerous recharging; but, as we are going underground, you can see two or three fired." This we did, and found the hole full of water, the stream pouring down in every direction, rendering it wholly impossible to keep it dry for two minutes at a time. Into the hole was dropped the cartridge, armed with Bickford's fuse. The tamping proceeded deliberately, and the result of the shot was certainly most effective: this hole was only 20 in. deep. The captain now ordered a hole to be sunk nearly 3 feet 6 in. in granite, which being done, the cartridge was put to the bottom, the hole filled with water, and the shot fired without tamping of any kind. To my surprise, the ground was torn just as much as if it had been tamped with the best material, and was the simplest mode of firing I ever saw. Though the men admitted the effect was prodigious, still old ways must be followed, and the tamping resumed at the next hole.

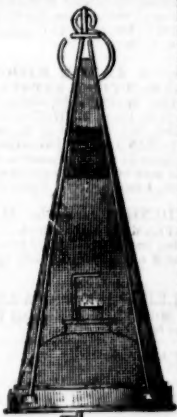
A succession of experiments at this and other wet mines convinced me of their decided superiority over the old method, and that safety and certainty of firing are the true economies of this part of mining science, and cannot be too strongly recommended or urged. As most of our readers doubtless are aware, the safety fuse is a kind of rope, ingeniously manufactured, and containing in its centre a continuous train of gunpowder. The rope being manufactured of tarred material, prevents the possibility of water affecting the powder, which is thereby rendered effective to any required length, and at any period of time.

The cartridge, by an ingenious contrivance, is made to fire at the bottom of the bag or hole, instead of the top, as was the case always in the old method; a series of experiments proves this mode of ignition to be infinitely more powerful. Thus, we see in the best contrived fire-arms the point of firing the powder is always as close as possible to the bottom of the charge; we have heard objections raised that this tends to throw out many particles of gunpowder unexploded, but experiment has shown to the contrary. However, we have nothing to do with the construction of the cartridge, but merely to testify as to its merits, and this we have great pleasure in doing, as in every instance in which we tried it the most perfect success resulted, the whole process of charging and firing was executed with a degree of certainty and safety it was pleasurable to witness; the men whom prejudice had not tendered stolid were loud in the praises of these their useful and safe assistants.

The only objection we heard, and which we are in duty bound to record, was, "The price, Sir; the price. If Mr. Copeland would lower them to 3s. or 3s. 6d. per dozen, we should use nothing else; as it is, we use them on the wettest ground only, but the day will come when nothing else will be used on wet ground like ours, and then he will be able to sell them cheaper; they will be as common as the safety-fuse, and will do as much good. Without that we could now hardly do: we should not like to be forced back to the old rush again, Sir."

Prejudice—that poison of the mind, that bar to improvement, curse to invention, and ruin to the inventor—for many years prevented the general introduction of that very fuse these miners had been so loudly extolling! The author has heard it frequently condemned by practical working miners as a "new-fangled fancy," which never could, and never would, answer the desired and professed end. "Give me the old rush and snuff," answer Prejudice, content to wear disfigured features and maimed limbs, the consequences of her own stupid shortsightedness. "Give me a bit of brown paper and a candle, and I will make you as good and as sound a cartridge as Copeland; aye, and one that shall stand as much water, too," cries Prejudice, whilst sitting on the threshold of destruction, picking out a hole that had missed fire. And "Give me a good dry hole and blasting powder, and I will produce ten times the effect Copeland can do, with half the cost," cries Prejudice again, as she laboriously sits tamping the dangerous charge. But pray, Prejudice, do be induced to try the experiment, and let those under your dominion who have not yet done so try the safety-fuse and the cartridge; then see whether the one will not come into as universal demand as the other, and rendered at a far cheaper rate than now; when they will certainly be acknowledged to be, as we declare at the head of our paper, the "Miners' Friends." All honour be to the names of their inventors!

SAFETY-LAMP.—In again soliciting the attention of our readers to the improved Miner's Safety-Lamp, invented by Mr. W. P. Struvé, of Swansea, we have the pleasure of submitting an engraved sketch of it, and to add some important information as to the successful and very satisfactory results which have ensued from its use in some of the largest and fieriest collieries in South Wales. The sketch of it in the margin will convey a better notion of it than any written description, and it is only needful to add, that although the diameter of the gauze cylinder at its base is considerably more than that of the Davy, yet owing to the oil-box being placed within the gauze cylinder, instead of below it, and thus occupying a considerable portion of the internal space, the cubical contents of the cylinder does not exceed that of an ordinary Davy. The greater amount of cooling surface near the flame, and the less obstructed admission of air thus obtained, renders it practicable and perfectly safe to use a larger wick than in the Davy, whilst the combustion of the oil is much more perfect and the smoke very considerably diminished. The light emitted from this lamp has been carefully ascertained to be equal to that from three Davys, and owing to the conical form of the cylinder and the shape of the oil-box, it diffuses the light both upwards and downwards, as well as in every other direction, with less shadow than any other lamp that has been offered to the miner. From a more perfect combustion, the consumption of oil in this lamp but slightly exceeds that of the Davy, whilst its simplicity of construction gives great facilities for keeping it in order and for repairs. It barely weighs 1½ lb. We are glad to learn that this lamp has been extensively introduced into many of the fieriest collieries in South Wales, and that, although Mr. Struvé has made arrangements with a highly respectable Birmingham manufacturer for a large supply of them, the demand is so great as to exceed the supply at present. This fact speaks well, both as regards the value of the invention and the anxiety evinced on the part of the coal owners of that district for the safety and comfort of their workmen. By this invention the accomplishment of the long-desired object of discovering a lamp which the miners would readily adopt in the place of candles has been effected; for we are informed, on unquestionable authority, that wherever this lamp has been introduced, the miners eagerly accept it, and give it a decided preference, not only to the Davy or any other lamp, but even to candles. This fact, which may be safely relied on, is a most important one, and will, we trust, tend to the speedy diminution of accidents from explosions. The light being so much greater, and so much more diffused than in the Davy, there is no temptation to remove the gauze cylinder, and thus another fruitful source of evil is removed. In concluding our remarks upon this important topic, we cannot refrain from congratulating Mr. W. P. Struvé, of Swansea, on the success which has attended his meritorious exertions to produce a lamp with all the requisites which have been so long desired, and the miners on having at last obtained a lamp by which they can safely and efficiently pursue their arduous labours, and which eclipses and throws into the shade their long-loved but dangerous candles.



GRANTS OF PROVISIONAL PROTECTION FOR SIX MONTHS.—M. J. and M. W. TURNER, Woodstock, Surrey: Compound pipes and tubes for sewers, drains, chimneys, gas, and other purposes. — E. HOSKOT, Regent's Park: Electric telegraphs. — J. B. HOWELL, J. SHOOTER, Sheffield: Rolling steel for springs. — T. NEWBY, J. CORRIE, W. H. PARKES, Birmingham: Treating or coating steel pens and pen holders, to prevent the oxidation of same, which method of treating or coating may also be applied to other articles of iron and steel. — R. MURPHY, Coleford: Manufacture of iron. — W. J. KENDALL, Norwich: Safety signals for railways. — A. C. KENNARD, Falkirk Ironworks, Strirling, N.B.: Truss-iron bridges. — J. Moss, T. and J. GAMBELL, Sheffield: Manufacture of cast-steel hoops and cylinders. — A. CHALLEN, Glasgow: Steam engines, and in the combustion of fuel. — J. BOYD, Camden-town: Carriages propelled by steam or other power. — J. WADSWORTH, Hazelgrove, Chester: Artificial light, and in apparatus applicable thereto. — A. PARKES, Birmingham: Joining or uniting metals. — F. O. WARD, Cork-street, Burlington-gardens: Liberating or producing potash or soda, or both (as the case may be) from natural silicates, the residue of the process being available as a material for manure, puzzolane, or hydraulic cement. — W. H. TOOT, Summer-street, Southwark: Furnaces. — P. W. BARLOW, Great George-street, Westminster: Permanent way of railways. — G. WILSON, Sheffield: Furnaces for first-class steam-boilers. — A. and H. PARKES, Birmingham: Manufacture of rods, wire, nails, and tubes. — J. W. CLARE, Surrey, Surrey: Steam engines, boilers, and furnaces. — R. HARVEY, Glasgow: Steam hammers. — A. SLATE, Adelaide-road, Haverstock-hill: Supplying fuel to blast furnaces. — J. and J. H. ELLIS, Leicester: Reducing into small particles masses of rock and minerals. — G. E. DERING, Lockleys: Electric telegraphs, and in the manufacture of insulated wire and cables.

PRACTICAL ENGINEERS.—We understand that measures are being adopted to organize an engineering club in London. A preliminary meeting will shortly be held, at which, among other matters, it will be proposed to include every branch of engineering science, whether in Mining, Railways, or Canals. Amongst the objects of the club, it is intended to compile a list of the names of the members, and to compile an extensive library and lecture theatre, for the convenience of the members, and it is hoped the numerous and intelligent body connected with engineering will at once see the importance of such an institution.

PUDDLING MACHINE.—Mr. A. Newton, has patented an invention, for a foreigner, which consists in agitating and working the fluid or semi-fluid iron with an instrument which passes through the roof of the furnace. A stone block is inserted into the top of the furnace, and in this the instrument works; to the lower end a cross-piece is attached, which robs the iron, and at the upper end is a toothed wheel, which works into a toothed sector. The rubble is kept cool by a current of cold air or water passing through it. When air is used the outlet pipe may be connected with the blowing cylinder or otherwise.

PUNCHING METALS.—Mr. Hiram Powers, of Florence, has patented a machine in which a simple lever is applied by its shoulder and cog, or tooth, to propel and withdraw the notched shaft of a punching stamp, moving in a closely fitting tube, and thence upon the plate to be operated on. The plate is inserted in a chasm, and is thrown off from the retreating tool by coming in contact with an abutment at the end of the tube occupied by the tool shaft, or by some other device. He also proposes to introduce a double or compound lever to increase the power of the machine. In this case the shoulder or cog of the single lever is made to cause an intermediate lever, similarly constructed, to act on the shaft in a similar manner. The shaft is constructed to receive tools of various sizes.

RAILWAY BREAKS.—Mr. Therrin, Dieppe, provisionally specified an improvement which consists in providing all or only part of the wheels of the railway carriages with breaks. These breaks work directly behind each wheel of the carriages by means of two horizontal and longitudinal iron bars, supported by two lever branches pinned to a transversal spindle, resting upon bearers strongly fixed up to the bottom floor of the carriages. The bars continue all the length, being joined at each end of every carriage by a joined band, disposed in such a way as to make the spindle turn. It is under the locomotive tender the different pieces which move the breaks are arranged either to pull close or to loosen. There are, even with the bottom of the tender, are fixed two cast-iron supports, in which two right angles are fastened with pegs the extremity of their angle, so that they may turn with facility. At the extremities of two of the arms of the right angles are fixed with pegs the ends of the bars, horizontal and longitudinal, above mentioned. At the extremities of the other arms of the right angles are fixed the ends of two upright pieces, attached to two levers bearing chains at their extremities, which, by the means of an iron windlass carrying spokes and ratchet wheels, and worked by the guard, sets the whole system in motion; it would be preferable to put the apparatus on the tender, though it might be put anywhere; but there it would prevent accidents, and not inconvenience the fireman in any way.

LUBRICATING BOXES FOR AXLES, &c.—Mr. Cresswell, Conduit-street, provisionally specified an invention for rendering the lubrication of axles of machinery, of carriage wheels, and other axles and rotating parts which require it, constant, and as far as possible independent of the labour of the engine-driver. The invention consists in a box, having an intervening flange or washer, with a reservoir sunk in its upper part for the reception of the lubricating fluid, and a suitable groove communicating above with the reservoir and below with the part to be lubricated for the passage of the unctuous material. Around these is placed a hollow revolving cylinder, which receives the lubricating material after it has done its work, and by its motion conveys it to the upper part, where meeting with a conductor it is directed into a reservoir, from whence it started to be re-employed as before. By this arrangement the flow of the lubricating fluid is constant, and the supply is regulated as required.

LIGHTING RAILWAY TRAINS WITH GAS.—Mr. Charles Hadley, of Birmingham, it appears, entitled to the honour of being the first to propose lighting railway carriages with gas. Alluding to the reference made, at a recent meeting of the Institution of Mechanical Engineers, to the proposition as having emanated from Mr. Thompson, Mr. Hadley says, "Such pretended invention is a direct abstract, word for word, of a prospectus for accomplishing that object, issued by me in 1853, and of which upwards of 1000 copies were then, and up to March in the following year, distributed by me to the directors of every railway then in existence, or for which an Act was obtained, in England, Ireland, Scotland, and Wales. In addition to which, a copy was posted to the engineers, secretaries, managers, and the other officials, of each line throughout the United Kingdom, and to the editors of several newspapers. A short description appeared in the *Birmingham Journal* of Nov. 21, 1853, and the invention was noticed in the *Mining Journal* about the same date. Application was also made, by me, for permission to supply copies to the members of the Institution of Mechanical Engineers, but not entertained. Since which, at intervals, the subject has been brought forward by me, and its importance urged upon the notice of the Society of Arts, the Board of Trade, Prince Albert (for adoption on the royal train), and various railway, mining, and steamship companies, having exhausted every possible means for bringing its important advantages into operation up to this date."

LIME-COKE.—Dr. Herman Bleibtreu, Bonn, Prussia, has patented an invention to prevent the impurities of coal, such as sulphur, silica, alumina, phosphorus, &c., from exercising an injurious influence upon the products of metallurgical processes. Small coal or crushed coal is mixed with powdered limestone, chalk, burnt lime, or other calcareous substance. This calcareous compound is mixed with the coal intended to be converted into coke, in proportions depending on the nature and quantity of the injurious ingredients contained in the special variety of coal. When the coal has been mixed with the calcareous substance it is converted into coke in the ordinary way, and the "lime-coke" thus obtained is employed for the metallurgical processes instead of the ordinary coal or coke. In the use of coke prepared as above described, the conditions are secured for converting the injurious substances of the coal into innocuous slags previous to their coming in contact with the ores or the metal.

PROPELLING VESSELS.—Mr. Rodd, Earls Court, provisionally specified the supporting of a ship out of the water, or on the surface of the water, by means of air-tight drums, and propelling the ship by fixing floats upon one pair (or more) of the drums. The ship is made of the usual form, or of any other form, as may be deemed advisable. Through the ship is rigidly attached one of the shafts which carry one pair of the drums, these drums are loose on this shaft, so as to allow them to turn when the ship or other vessel is moving, thereby offering but little resistance to its progress. The other shaft, which carries another pair of drums rigidly attached to it, is cranked and supported by suitable bearings in the vessel. Floats are fixed on these drums for the purpose of propelling the ship, motion being given to them by steam or other motive power. The ship may be propelled by a screw propeller, or it may have all the drums loose on the shafts, and the shafts attached to the ship, and be propelled by paddle-wheels fixed at the sides, bow, stern, or under the said vessel, or it may be propelled by any other means used to propel vessels. As many drums as may be deemed necessary can be used, this, however, will be regulated according to the dimensions of the ship or other vessel.

NEW ELECTRO-METALLURGICAL PROCESS.—In the electric deposition of metals and their alloys Mr. Walen, of Chancery-lane, proposed and has secured by patent the application of aqueous solutions of tartrate of ammonium and cyanide of potassium in combination, in proportions varying according to the metal to be deposited. For copper, he uses one part of the tartrate and eight parts of the cyanide; for silver, five parts of the tartrate, one part of the cyanide; for gold, three parts of the tartrate, one part of the cyanide; for zinc, one part of the tartrate, six parts of the cyanide; and for the alloy brass, equal parts of tartrate and cyanide. In this menstruum he dissolves cyanides, tartrates, or any other suitable salt or compound of the metal to be deposited. He usually employs the solution cold, but it may be used either hot or cold, according to circumstances, the hot solution depositing quicker than the cold solution, and enabling the acids of the solvent to have a more energetic action on the positive plate. The solution for depositing may also be made by the assistance of a galvanic battery, or other sufficient source of electric power, by mixing the cyanide and tartrate in the desired proportions, and using a large positive plate of the metal or alloy to be deposited, and a fine wire for a negative plate to charge the solvent solution with the quantity of metal necessary to give a regular deposit. The tartrate of ammonium alluded to is the neutral tartrate; but the other compounds of tartaric acid and ammonia, or free tartaric acid or ammonia, or hydrocyanic acid may be used. The proportions of the tartrate and cyanide are alterable according to the relative proportions of the metals to be deposited, the colour of the resulting alloy being also determinable by these means; for instance, in brass, an excess of cyanide of potassium causes more copper to be deposited; in bronze the same; other alloys may also be obtained. The degree of saturation of the solution in which the salts are to be used may be varied according to circumstances; for general purposes, five times the weight of water is added to the salts in the solid form.

IRON SHIPS.—Mr. J. Jordan, Liverpool, provisionally specified an invention which consists in constructing vessels with a water-tight inner ceiling of iron, extending from the upper to the lower deck, and connecting it with a water-tight lower deck of iron, so as to form a perfectly water-tight chamber within the ribs of the vessel, the hatches being so constructed that they may be packed and made perfectly water-tight, so that, should the lower hold become filled with water by accident, the vessel will be sustained by her buoyancy above the lower deck, and by which arrangement vessels so constructed are greatly increased in strength. When the invention is applied to large vessels, they are constructed with an inner skin or ceiling of iron, and having their lower deck formed of iron, which is caulked and made water-tight. The top or ceiling of the vessel is carried up to the gunwale and closed above the top by plates forming a covering board, and which is fastened to the outer and inner skin by angle or any other suitably shaped iron, the whole being made tight by caulking. The inner skin or vessel, which being riveted together forms an inner vessel in one piece with the outer skin, and which inner skin or inner vessel, in large vessels, it is proposed to carry fore and aft from the fore peak bulkhead to the after peak bulkhead, which are water-tight, as now required by the underwriters' regulations, or it may be carried fore and aft. If preferred, the iron deck may be carried beyond the bulkheads. The hatches of the lower deck are con-

structed so that they may be securely fastened down and packed so as to be perfectly water-tight, and the pumps, masts, and so forth, are to be so secured that water cannot enter the apartment of the vessel through which they pass. When this invention is applied to small vessels not requiring between decks, it is proposed to make safety compartments capable of floating and sustaining the vessel in case of accident, by forming the fore-cabin and cabin into safety compartments by laying iron water-tight decks joined to the water-tight bulkheads, and securing it to the water-tight inner skin of the vessel and forming the stern of an iron box, thus making as it were life-boats of the cabin, fore-cabin, and gunwale.

SLIDE VALVE.—Mr. W. E. Newton, for a foreigner, has patented an improved mode of relieving the slide valves of steam-engines from unnecessary pressure, which consists in the construction or formation of a steam chamber between the valve and its seat, or partly in the valve and partly in the seat, which chamber is to be filled constantly with live steam from the steam chest. The steam in this chamber acts in opposition to that in the open part of the steam chest at the back of the valve, so as to balance the valve to such an extent as is desirable, leaving only such an excess of pressure on the back of the valve as to keep it in close contact with its seat.

COATING THE CELLS OF GALVANIC BATTERIES.—An improvement in the cells of galvanic batteries, and in crucibles, by the deoxidizing of platinum and iridium by heat, when applied to the surfaces, was provisionally specified by Mr. S. Hogg, of Marylebone-street. A solution of these metals is applied over the metals when made of certain aluminous earths or of carbonaceous substances, which being heated, the metals are decomposed, and a thin metallic substance remains tenaciously adherent to the surface. By this process the whole of the inside of the cell of a galvanic battery being lined with a metal coating, is converted into a most perfect negative element, and the use of a plate of platinum may thus be dispensed with. For crucibles, the process over the exterior surface of a brass moistened with the metal solution, subjects the same to heat, by which a metallic surface is produced on the outside of the crucible, which will prevent the carbon combining with the oxygen, and consequently the crucible will be preserved from burning when in use.

GUEVIN'S SELF-ACTING BREAK.—At the Institution of Civil Engineers, on Tuesday, an interesting paper, from M. E. Guérin, of Paris (whose invention has already been noticed in this Journal), was read. He pointed out what he considered to be the radical defects of the present system of break. The engine driver, who regulated the moving power, and who ought also to have at his command all the means for stopping the train, was obliged to communicate by signal with the break-guards, and to rely on their assistance for checking the velocity. In nearly all the various arrangements which had been proposed for rendering breaks self-acting, it had been an essential condition that the engine-driver should, in the first instance, stop or slacken his motive power, in order to bring, or at least prepare to bring, the break apparatus into action. Mr. Guérin, in 1839, proposed to take advantage of the pressure exerted on the buffers, when the engine power was stopped, by the momentum, or *vis viva*, accumulated in the mass of the train. In 1846, the late Mr. George Stephenson introduced on the Liverpool and Manchester Railway a self-acting buffer break. The break to which he adopted the self-acting apparatus, was the ordinary one, with the friction blocks connected by knee-jointed links. The horizontal shaft working the knee joint acted carried a short lever at each extremity, placed just outside the truck frame, and acted on by a rod communicating with the buffers. The moment any pressure came upon the buffers, by the momentum of the train the rods and levers caused the breaks to be forced against the wheels; and by means of an ingeniously arranged tension spring, the force acting on the break could be varied at pleasure. When it was intended to back the train, the apparatus was thrown out of action, by a simple contrivance for raising the bar out of connection with the buffers. The claim of M. Guérin was for carrying this principle into practice more effectually and beneficially than previously, and for removing some obstacles which stood in the way of its general adoption. The most serious of these was the difficulty of throwing the break apparatus out of gear during the indispensable process of backing and shunting the trains. The invention was described to consist mainly in an adaptation of centrifugal force, which perfected Mr. Stephenson's break, and rendered it automatic. The lever on the break spindle was attached to the middle of one of the buffer springs. When the buffers were pressed in, this spring moved with them, carrying inwards the end of the lever, and thus throwing the break into action. This intervention of the buffer spring was important, inasmuch as it tempered the force applied, and so prevented any sudden strain, and consequent dislocation of the breaking apparatus. The facility of backing and shunting was obtained by means of a cast-iron centrifugal clutch, attached to one of the main axles, on which it swung, revolving with the axle. When the train attained a certain velocity, the position of this clutch changed, and the fork piece attached to the cross-beam of the carriage frame was raised. The apparatus was then ready to be brought into play by pressure on the buffers. When the train was at rest, or was travelling at a speed below the determined velocity, the fork piece dropped down between the carriage frame and the shoulder of the draw-rod, and in that position prevented the inward motion of the buffer spring, which was necessary to bring the break into action. The train could then be backed or shunted without the break acting. The discussion on the paper was reserved until Thursday next. We understand that the break is about to be tried on the South-Eastern Railway, when railway directors and engineers will have an opportunity of testing its practical efficacy.

NEW BRIDGE FOR RAILWAYS.—At the last meeting of the Franklin Institute, an ingenious combined counter-braced arch and truss bridge, designed by Major Robert Walker, in two spans of 150 ft. each, was described. In practice this bridge has proved itself to be remarkably strong and stiff. The chief peculiarity in it is the arrangement of the truss rods—these are not only in pairs on each truss, but are divided at the arch, where they separately take hold of a cast-iron saddle, so that by acting upon screws cut both at top and bottom of the truss rods, the strains produced by the bridge and its load may at will be thrown either upon the arch, upon the truss, or divided between the two, so as to bring into play the utmost strength of both.

PREVENTION OF STEAM BOILER EXPLOSIONS.—To prevent explosions in steam boilers Mr. George Dealey, of West Bromwich, proposes the adaptation to the safety-valve of a float and lever which, when the water sinks below a certain level, will set upon the safety valve and lift it from its seat, thereby allowing the steam to escape from the boiler. In combination with this contrivance he employs a steam whistle, which is fixed on the end of a pipe which communicates with the inside of the boiler. A cock is placed inside the boiler and is worked by the float or the lever connected therewith, so that when the level of the water sinks, and the float descends with it, the cock on the whistle-pipe will be opened and the steam allowed to escape. The whistle cannot be stopped until the water is supplied. If the water be allowed to sink further the safety-valve will be opened and the steam allowed to escape.

GUIDE TO THE IRON TRADE.—A most elaborate set of tables, for showing the weight of iron required to produce boiler-plates, sheet iron, flat, square, and round bars, and hoop or strip-iron of any dimensions, has been compiled by Mr. Jas. Rose, of Bateman's Hill Iron-works, Staffordshire. The work is of a thoroughly practical character, and nothing of the kind has hitherto been published. The tables are so arranged that the information desired can be instantly and accurately obtained. They show the weight of good iron required to produce the various descriptions of manufactured iron, allowance being made for heating, rolling, and cropping; and, as they are the result of many years' experience, their value cannot be doubted. As the want of such a set of tables has long been greatly felt, the present work is a desideratum; and, as it is not too bulky for the pocket, it will, no doubt, speedily become the constant companion of everyone connected with the iron trade. The printing is well done, and the tables so arranged that each page is complete in itself. The work is published at the *Mining Journal* office, price 8s. 6d.

PATENTEE'S MANUAL.—Messrs. Johnson, the patent agents, of London and Glasgow, have just issued a second edition of their very useful treatise on the Law and Practice of Letters Patent. In referring to the first edition, we gave it as our opinion that the work would prove a valuable guide to all inventors, or other persons having business connection with patents; and we are further expressing our approval than by stating, that in the present issue, the information given has been rendered much more complete, and brought down to the present time. The nature of a patented invention is fully explained, and we think no one could require more ample details upon any point they may be at a loss upon than can be gathered from the *Patentee's Manual*.

THE EAST GLAMORGANSHIRE PRIZE ASSOCIATION have just issued their report for the past year, from which it appears that at the recent examination at Cardiff 130 children were examined, and that 91 prizes were awarded, their value being upwards of 50l. The parents of the majority of the children who appear in the prize lists are connected with mining and ironworking, the Down's school sending a larger number than any other. The examination papers contained questions of a practical and useful character, and the Rev. H. W. Bellairs and Mr. Bowstead, the examiners' expressed themselves satisfied with the answers given.

GOLD IN NEW ZEALAND.—A letter from Nelson (Oct. 23), referring to the gold discoveries, says, "The gold fields, beyond a doubt, are very extensive and very rich, and so soon as the rains are over, and the rivers less flooded, the harvest will commence. Great numbers are flocking from all parts of New Zealand, and also from Australia. During the last ten days gold has been found about three miles from Nelson, but I have not heard of productive enough to pay for working. Our spring is now closing, and everything looks beautiful."

MADAME TESSAUD'S EXHIBITION.—Another highly interesting portrait model has been added to the collection of heroes in this popular establishment; it represents the Commander-in-Chief in India, the gallant Sir Colin Campbell, G.C.B. The exhibition is dressed in the uniform of a general, decorated with numerous military orders, among which that of the Order of the Bath. The figure is admirably constructed, and the likeness is considered most faithful.

AIR SHEETING, OR BRATTICE CLOTH, made expressly for COLLIERY PURPOSES, in all widths, from 18 in. to 80 in.—Samples, with price, on application to the manufacturer, ELLIS LEVEY, Ellismere-place, Stockport-road, Manchester.

NICKEL ORES.—THE GAP MINING COMPANY OF LANCASTER, county Pennsylvania, are now ready to CONTRACT for the SALE of fine NICKEL ORES, in lots to suit purchasers.—Address, F. S. HOCKLEY, Secretary Gap Mining Company, 70, South Third-street, Philadelphia, Pennsylvania, U.S.

MESSRS. FULLER AND CO., 51, THREADNEEDLE STREET, LONDON, continue to TRANSACT BUSINESS in BANKING, MINING, and RAILWAY SHARES, many of which will pay 20 per cent., with every prospect of increasing considerably in value.

Since calling attention to a few mines, the following rise in value has taken place:—Gravelock No. 230 to 240, being 10, 55s. to 60s.; Cornhill, 23½ to 26½, or £12, 85s.; East Wyal Russell, 10s. to 12s.; or £10, 00s. to £12, 00s.; or £12, 144: total increase in value, £45, 58s., and still rising.

Messrs. FULLER and Co. have FOR SALE Dividend Shares, much below their real value, and must increase in price; also, a few shares conducted on the Limited Liability Act, which in a short time will become a safe dividend property; also, Shares in the leading Banks, and £2000 Railway Bonds.

Every information afforded at the office, between Ten and Five. Communications promptly attended to.

UNITED STATES OF AMERICA.—DUFEY, PERKINS, and SAYLES, BOSTON, MASSACHUSETTS, BROKERS for the PURCHASE and SALE of STATE, CITY, and RAILROAD SECURITIES, MANUFACTURING and BANK SHARES, give particular attention to the MINING COMPANIES OF LAKE SUPERIOR, and furnish reliable information concerning them. [DUFY, PERKINS, and SAYLES refer to the Editor of the *Mining Journal*.]

THE PATENT LAW, AS RECENTLY AMENDED.—No. VII.

BY F. W. CAMPIN.

PROLONGATION.—The great difficulty of bringing out and getting into successful operation some inventions obliged many patentees, in former days, to appeal to Parliament for special or private Acts to prolong their patents; thus Watt's patent right was prolonged for thirty years. This appeal to the Legislature being very costly and, perhaps, unsatisfactory, led to the passing of a law whereby it should in future be rendered generally unnecessary. Thus the Act of 1835 allows any patentee to petition Her Majesty in Council for an extension of his patent right for not more than seven years further, though the Council may, and often does, grant less time. The Act 2 and 3 Vict., cap. 67, repeals a clause in the above Act which prescribed that application for prolongation "should be prosecuted with effect" before the expiration of the term of the original patent; and this Act requires that the petition for prolongation be presented six months at the least before the expiration of the first patent. By the Privy Council Act, 7 and 8 Vict., cap. 62, the term of prolongation may be 14 years or less. To obtain the prolongation, whether for 7 or 14 years, or for a less term, it is necessary to present a proper petition to Her Majesty in Council, which petition should state that the patent about to expire is a good and valid patent, that the invention is new and useful, and that the patentee has hitherto suffered loss by his efforts to bring the invention into remunerative use. All this the patentee may be called upon to prove as far as may be in the Court of the Judicial Committee of the Privy Council, and the patentee will have to answer any opponents that may claim to be heard against the prolongation of the original patent. In almost all cases the Attorney-General, or some other counsel for the Crown, watches the proceedings on behalf of the Crown, and perhaps opposes the prolongation. Assignees may obtain prolongations as well as the original patentee; but a special condition may be inserted in the patent of prolongation—that the original patentee shall receive further benefit from the invention (*in re* Whitehouse's patent). And those persons who have taken licenses under the original patent will be protected. The cases as to prolongations comprise, amongst others, Bodmer's, Macintosh's, Woodcroft's, Erard's, and Kays' patents.—*Patent Office, Strand.*

NOTES ON EXTRACTION OF SILVER.—The method proposed by Professor Marian, in 1854, for working the rich ores of the Joachimsthal has recently been tried by Mr. Paters, in the hope that by this means Ziervogel's method of extraction might be adopted for the majority of ores. The powdered ores were mixed with an equal weight of sulphate of iron (green copperas), and exposed to a gradually increased heat, until the mass no longer contained protoxide of iron. The roasting was stopped at this point, because it was found that when the heat was continued, and the persulphate of iron decomposed, the yield of silver was reduced. The amount of copper in these ores is too small to be of consequence. The roasted charge, when treated with water, gave a liquid containing much persulphate of iron; this was mixed with sulphuric acid, for the purpose of dissolving the compound of basic persulphate of iron and sulphate of silver, which is but sparingly soluble in water. With ores containing metallic silver and sulphur of silver, 80 per cent. of the silver they contained was obtained by treating them with sulphuric acid in one operation. When operating upon ores containing sulphur and arseniuret of silver with sulphuric acid, no silver was extracted on treating the roasted ore with water. This was found to be owing to the production of insoluble arsenate of silver, from the oxidation of the arseniuret by sulphuric acid and atmospheric oxygen. But when sulphate of iron is used in the roasting the result is different; much sulphuric acid is given off, and only a little arsenious acid, the arsenic being chiefly converted into arsenic acid, which combines with the peroxide of iron, while sulphate of silver is dissolved on treating the roasted ore with water. In this way 87 per cent. of the silver was obtained from arsenical ores. It appears, therefore, that the oxide of iron plays an important part in this operation, and in roasting argentiferous ores containing arsenic or antimony, for the purpose of extracting the silver by Ziervogel's method, this circumstance must be borne in mind.—*Polytechn. Central Blatt, 1857.*

THE NEW MIDLAND MINING COMPANY (LIMITED).

In 2000 shares of £1 each.
A deposit of 2s. 6d. per share must accompany each application.
The above company have purchased the mine and valuable plant at Ashover, late the property of the Old Midland Mining Company, on very favourable terms, and they propose to raise the necessary capital for working the same by the issue of shares, as above.
The company's prospects are exceedingly favourable and encouraging, and they have little doubt of ultimate success. They point with confidence to the annexed report of Mr. Boden, the late manager of the mine, who has taken a large interest in the new undertaking. It is as follows:—
GENTLEMEN.—In my last report to the late company of the Midland Mine, Ashover, I stated what had been done, and what ought to be done, which I now repeat. The abrupt manner in which that company terminated (which was in consequence of the capital being expended) left the mine in a very unsatisfactory state, and quite unproved. The shaft is 35 fms. - the last 12 of which were sunk without driving to the vein, except at the topstone. In the majority of instances, the vein is worthless down at the topstone, although it is a good vein a few fathoms above. The vein ought to be found at the little clay, at the top of the white stone, for I am confident the best earriage in the white stone will be found at that place. This is about 9 fms. from the topstone, and would not cost more than £10 in driving; at the same time, the east end should be cut forward, to intersect the veins that are known to be cross-lag on the south side. The junction of these veins with the Midland has never been proved in any age, being too low for the old man to reach with his means of lifting water, the measures having over-dipped him before reaching that point; consequently, there is a two-fold advantage in driving the east end, for you will meet the measures in which the old man's best works have been, or the measures next the shale, and cross the veins from the south side at the same time. This being done, it is a moral certainty that the vein will be immensely rich; the last price for driving the east end was £5 15s. per fm., the shareholder taking the ore. I can now get it done for £5 per fm., and I believe that in 48 stops before you, all laid dry, with the pump shaft sunk to the topstone. The pumps and engines are in a most efficient state, and I have no hesitation in saying that one engine and one engine tender, pumping twelve hours per day, will keep the water below the level of the east end. From my personal knowledge and practical experience of the mine and district, I believe your property to be valuable.
JOHN BODEN, Mineral Agent.

Application for shares and other information to be made to Mr. JAMES BUNTING, secretary pro tem., Beetwell-street, Chesterfield; or to Mr. E. B. PALMER, Mineral Record Office, Chesterfield, Jan. 7, 1858.

INVESTMENTS IN BRITISH MINES.

Full particulars of the most important Dividend and Progressive Mines will be found in the Fourth Edition of
BRITISH MINES CONSIDERED AS AN INVESTMENT.

Recently published, by J. H. MURCHISON, Esq., F.G.S., F.R.S.
Pp. 336; price 3s. 6d., by post 4s.
Mr. MURCHISON also publishes a QUARTERLY REVIEW OF BRITISH MINING, giving, at the same time, the Position and Prospects of the Mines at the end of each Quarter, the Dividends Paid, &c. The Review for the Quarter ending the 30th of June, contains a Map of the Great Wharfedale and Leland Mining Districts, price 1s. Reliable information and advice will at any time be given by Mr. MURCHISON, either personally or by letter, at his office, 117, Bishopsgate-street Within, London, where copies of the above publications can be obtained.

OPINIONS OF THE PRESS.

Mr. Murchison's new work on British Mines is attracting a great deal of attention, and is considered a very useful publication, and calculated to considerably improve the position of home mine investments.—*Mining Journal.*
The book will be found extremely valuable.—*Observer.*
A valuable little book.—*Globe.*
A valuable guide to investors.—*Herald.*
Mr. Murchison takes sound views upon the important subject of his book, and has placed, for a small sum, within the reach of all persons contemplating making investments in mining shares that information which should prevent rash speculation and unproductive outlay of capital in mines.—*Morning Herald.*
Of special interest to persons having capital employed, or who may be desirous of investing in mines.—*Morning Chronicle.*
Particulars requiring information on mining investments will find no better and safer instructor than Mr. Murchison.—*Leeds Times.*
As a guide for the investment of capital in mining operations is inestimable. One of the most valuable mining publications which has come under our notice, and contains more information than any other on the subject of which it treats.—*Derby Telegraph.*
To those who wish to invest capital in British mines, this work is of the first importance.—*Welshman.*
This work enables the capitalist to invest on sound principles; it is, in truth, an excellent guide.—*Plymouth Journal.*
All who have invested, or intend to invest, in mines, will do well to consult this very useful work.—*Ipwich Express.*
This is really a practical work for the capitalist.—*Stockport Advertiser.*
Persons desirous to invest their capital in mining speculations, will find this work a very useful guide.—*Warwick Advertiser.*
It is full of carefully compiled and reliable information relative to all the known mines in the United Kingdom.—*Sheffield Free Press.*
Those interested in mining affairs, or who are desirous of becoming speculators, should obtain and carefully peruse the work.—*Monmouth Beacon.*
Every person connected, or who thinks of connecting himself with mining speculations, should possess himself of this book.—*North Wales Chronicle.*
A very valuable book.—*Cornwall Gazette.*
All who have invested, or intend to invest, in mines, should peruse this able work. We believe a more useful publication, or one more to be depended on, cannot be found.—*Flymouth Herald.*
With such a work in print, it would be gross neglect in an investor not to consult it before laying out his capital.—*Poole Herald.*
Mr. Murchison will be a safe and trustworthy guide, so far as British mines are concerned.—*Bath Express.*

MINING TIMBER.—DRAM NORWAY TIMBER, 9d. per foot; QUEBEC YELLOW PINE TIMBER, first quality, 13d. per foot. Bones Cellars, Truro, Jan. 12, 1858. JOHN GATLEY.

STEAM-ENGINES OF EVERY DESCRIPTION, including BEAM, CONDENSING, or HIGH-PRESSURE, HORIZONTAL or VERTICAL; also, LOCOMOTIVES, BOILERS, ENGINEERS' TOOLS, RAILWAY, COLLIERY, or OTHER PLANT and MACHINERY, may be had on the shortest notice, on application to WHEATLEY KIRK, merchant engineer, auctioneer, and valuer, Cross-street Chambers, Manchester.
N.B. See his Weekly Circular (established 1850), which may be had by post free.

GAS MANUFACTURING WORKS.—Municipal corporations, public companies, and private firms, who wish to MANUFACTURE their OWN GAS, can be SUPPLIED on the shortest notice with COMPLETE MACHINERY, &c., for the purpose, from 100 lights and upwards.—For prices, specifications, drawings, &c., apply to WHEATLEY KIRK, engineering auctioneer, and agent to the makers, Cross-street Chambers, Manchester.

CAPITAL NEW HIGH-PRESSURE VERTICAL STEAM-ENGINE, bore of cylinder 12 in., stroke 2 ft.; will be sold a bargain.—WHEATLEY KIRK, engineer and valuer, Cross-street Chambers, Manchester.

IRELAND.—Mr. WHEATLEY KIRK is instructed to PREPARE FOR SALE, BY AUCTION, the whole of that exceedingly valuable FOUNDRY and ENGINEERING ESTABLISHMENT, LAND, BUILDINGS, TOOLS, PLANT, and MACHINERY, known as the SHANNON FOUNDRY, Limerick, Ireland.—Further particulars in future papers, or of the auctioneer.

TO IRONMASTERS, ENGINEERS, AND FOUNDERS.—The HARRINGTON IRON COMPANY are now PREPARED TO SUPPLY MELTING and FORGE PIG-IRON, made from the rich HEMATITE IRON ORES of CUMBERLAND.—Address, HARRINGTON IRON COMPANY, Cumberland.

STEAM BOILERS.—COAL PROPRIETORS and others requiring BOILERS, for home use or export, of first-rate make, cheap, and proved to a high pressure, apply to
ELLIS LEVER, Ellesmere-place, Stockport-road, Manchester.

CONTRACTORS' AND COLLIERY RAILS, SINGLE HEADED (with chairs), TEE, BRIDGE, and TRAM RAILS, specially adapted for colliery and temporary lines.—For sections and prices, apply to Mr. F. TYNDALL, Kewton, near Newcastle, Staffordshire.

GENERAL MINING COMPANY FOR IRELAND (LIMITED).—NOTICE OF CALL.—The shareholders of the General Mining Company for Ireland (Limited) are hereby required to take notice, that the Directors have, at their meeting, held this day at their offices, 23, Westmoreland-street, resolved that a CALL OF TEN SHILLINGS be made upon each and every share held in said company; and that such call shall be paid into the National Bank, College-green, Dublin, to the credit of the trustees of said company, on or before Saturday, the 30th of February next; and also that interest, at the rate of 5 per cent., shall be charged upon any part of said call as shall remain unpaid after that day.
By order of the Board, MICHAEL BIRD, Sec.
23, Westmoreland-street, Dublin, Jan. 11, 1858.

GREATH WHEAL VOR UNITED MINES.—Notice is hereby given, that a SPECIAL GENERAL MEETING of shareholders in the above mines will be HELD at their office, Gresham House, Old Broad-street, on Wednesday, the 20th January, at Twelve o'clock precisely, to receive the Report of the Committee of Investigation, and transact the general business of the mine.
R. T. ALIBON, Secretary.
Gresham House, Old Broad-street, London, E.C., Jan. 11, 1858.

DUSTON IRON ORE COMPANY (LIMITED).—Notice is hereby given, that an EXTRAORDINARY GENERAL MEETING of the shareholders of the Duston Iron Ore Company (Limited) will be HELD at the company's offices, Wellington Chambers, Cannon-street, London, E.C., on Wednesday next, the 20th day of January, at One o'clock P.M. precisely, to receive the directors' report, and to take into consideration the affairs of the company, with a view of winding-up the same.
By order of the Board, THOMAS NURSE, Sec.
Wellington Chambers, Cannon-street, London, E.C., Jan. 13, 1858.

CONSOLIDATED COPPER MINES OF COBRE.—Notice is hereby given, that a HALF-YEARLY GENERAL MEETING of the proprietors of this association will be HELD, in conformity with the Deed of Settlement, at the offices of the company, Gresham House, Old Broad-street, on Tuesday, the 30th day of January inst., at One o'clock precisely.
On that day two directors (Charles William Grenfell, Esq., M.P., and Robert Passenger, Esq.) and one auditor (Alexander Drace, Esq.) will go out of office by rotation, agreeably to the Deed of Settlement, but are immediately eligible, and are candidates for re-election.
It is necessary that persons intending to offer themselves as candidates for the direction or auditorship should leave notice of such their intention, at the offices of the company, at least 14 days before the day of election, and exclusive thereof.
WALTER SHARP, } Directors of the Company.
GEO. WHITMORE, }
Gresham House, Old Broad-street, Jan. 5, 1858.

THE COMPANY OF THE PROPRIETORS OF THE ROYAL CONSOLIDATED COPPER MINES OF SAN FERNANDO, CUBA (LIMITED).—Notice is hereby given, that the SECOND ORDINARY GENERAL MEETING of this company will be HELD at the company's offices, No. 82, Gresham House, Old Broad-street, London, on Monday, the 1st day of February next, at One o'clock precisely, for the purpose of transacting the usual business of an ordinary general meeting, of receiving and considering a report from the directors on the present position of the company, and of adopting such resolutions in reference thereto as the meeting may deem expedient.
At this meeting two directors are to be elected in the room of two directors who retire, in conformity with the provisions of the Joint-Stock Companies Act, 1856.
The Transfer-books of the company will be closed on Monday, the 18th of January, and will remain closed until the meeting.
By order of the Board of Directors, ST. J. H. YOUNG, Secretary of the Company.
Gresham House, Old Broad-street, Jan. 12, 1858.

ROYAL SANTIAGO MINING COMPANY.—The Directors hereby give notice, that they expect to receive from the managers at the mines about the middle of next month information which may be of importance to the shareholders, and, consequently, they have POSTPONED the usual HALF-YEARLY MEETING until WEDNESDAY, the 3rd day of March next, to be then HELD at the office of the company, at Two o'clock precisely, when the directors will make their report.
The Directors also hereby give notice, that the half-yearly accounts and financial statement will be delivered to the shareholders upon application at the office on and after Friday next, the 15th inst.—38, Broad-street-buildings, Jan. 12, 1858.

DUN MOUNTAIN COPPER MINING COMPANY (LIMITED).—Notice is hereby given, that the ANNUAL GENERAL MEETING of shareholders of the Dun Mountain Copper Mining Company (Limited) will be HELD at the London Tavern on Wednesday, the 27th of January next, at One o'clock precisely, for the transaction of the ordinary business of the company.
At the said meeting the following directors will go out of office:—namely, Alex. Morrison, Esq., Austinferry; Joseph Stayer, Esq., Fenchurch-street; but, being eligible for re-election, they may be re-elected accordingly.
Notice is further given, that a Special Resolution will be proposed to reduce the number of directors from seven to six.
By order of the Board, FREDK. SAUNDERS, Sec.
6, Great Winchester-street, London, E.C., Jan. 12, 1858.

THE SCOTTISH AUSTRALIAN INVESTMENT COMPANY (LIMITED).—Notice is hereby given, that the HALF-YEARLY GENERAL MEETING of the shareholders of the Scottish Australian Investment Company (Limited) will be HELD at the London Tavern, Bishopsgate-street, London, on Friday, the 29th day of January inst., at One o'clock precisely.
The Transfer-books of the company will be closed on Tuesday, the 19th inst., preparatory to the meeting and payment of the dividend, and will remain so closed until after the 29th inst.
By order of the Directors, C. GRAINGER, Sec.
24, Gresham-street, London, Jan. 9, 1858.

THE LONDON AND VIRGINIA GOLD AND COPPER MINING COMPANY.—Notice is hereby given, that the undermentioned SHARES in this company, which have been forfeited under the provisions of the bye-laws, WILL BE SOLD, BY AUCTION, by Mr. THOMAS JOHNSON, at the City Auction Rooms, 39, Gracechurch-street, London, on Monday, the 18th day of January next, at Two o'clock in the afternoon.
By order of the Board of Directors, JOHN ANDERSON, Sec. and Cashier.
34, Lime-street, E.C., London, Dec. 10, 1857.

Numbers of the shares above referred to:—
20,751 to 20,808, 7,841 to 7,915, 11,031 to 11,130, 19,161 to 19,260, 35,371 to 36,000, 38,251 to 38,370, 22,961 to 23,060, 851 to 950, 9,741 to 9,940, 35,561 to 35,600, 6,241 to 6,280, 10,391 to 10,399, 19,061 to 19,065, 32,886 to 32,920, 26,071 to 26,720, 35,961 to 35,990, 32,731 to 32,830, 501 to 590, 8,666 to 11,15, 19,491 to 20,230, 35,951 to 35,990, 39,591 to 39,640, 9,296 to 9,315, 23,406 to 23,435, 10,191 to 10,220, 20,651 to 20,750, 25,196 to 25,208, 24,606 to 24,655, 28,921 to 28,970, 29,051 to 29,055, 19,066 to 19,100, 6,091 to 6,140, 33,231 to 33,430, 34,971 to 35,000, 29,076 to 29,125, 7,916 to 7,965, 5,091 to 5,240, 39,171 to 39,220, 39,741 to 39,930, 28,871 to 28,920, 28,971 to 29,020, 10,266 to 10,290, 7,966 to 8,015, 32,631 to 32,730, 28,881 to 28,920, 3,571 to 3,670, 10,931 to 11,030, 31,621 to 31,670, 21,351 to 21,450, 5,246 to 5,295, 751 to 850, 2,411 to 2,608, 3,671 to 3,770, 34,571 to 34,600, 19,601 to 19,620.

COPIAPO AND CALDERA RAILWAY.—Notice is hereby given, that the QUARTERLY DIVIDEND OF FOUR PER CENT. (declared in Copiapo on the 3d of October last) will be PAID to the holders of shares registered in England, at the Banking-house of Messrs. Williams, Deacon, and Co., on and after the 15th January inst.
By order, EDWARD J. COLE, Office of Registry and Transfer, 2, New Broad-street, Jan. 1, 1858.

COPIAPO EXTENSION RAILWAY COMPANY.—Notice is hereby given, that SIX MONTHS' INTEREST, at the rate of SIX PER CENT. per annum, will be PAYABLE on the deposit of £2 per share, on and after the 1st February inst., at the office of the company, 2, New Broad-street.
The scrip must be left at the office, and the necessary form of application for the interest filled up three clear days before the same can be paid.
London, Jan. 1, 1858. By order of the Directors, EDWARD J. COLE, Sec.

COPIAPO EXTENSION RAILWAY COMPANY.—Notice is hereby given, that the directors have made a CALL OF ONE POUND per share, payable at the Banking-house of Messrs. Williams, Deacon, and Co., on or before the 25th day of January inst.
The scrip certificates, together with the bankers' receipt, must be left at the office of the company, 2, New Broad-street, to have the call inscribed thereon.
London, Jan. 1, 1858. By order of the Directors, EDWARD J. COLE, Sec.

In the Court of Vice-Wardens of the Stannaries.—Stannaries of Cornwall.

In the Cause of PIKE v. MICHELL and OTHERS.
IN RE BELL and LANARTH UNITED MINES.
NOTICE IS HEREBY GIVEN, that, pursuant to an ORDER, or DECREE, made in the above Cause, and bearing date the 15th day of December last, a PUBLIC AUCTION will be HELD at the Registrar's Office, Truro, on Wednesday, the 27th day of January inst., at Twelve o'clock at noon, for SELLING—1 (50th) PART, or SHARE, of the Defendant Richard Michell, of Australia. 2 (50th) PARTS, or SHARES, of the Defendant James Laing. 3 (50th) PARTS, or SHARES, of the Defendant Matthew Butt; and 4 (50th) PARTS, or SHARES, of the Defendant Davies Treblock.
Respectively of and in the said mines, or as many of the said several shares of the said several defendants as may be necessary to satisfy the said Order, or Decree, and of and in the ORES, HALVANS, ENGINES, MACHINERY, MATERIALS, and OTHER EFFECTS upon and belonging to the said Mines.—For further information, application may be made to Mr. STOKES, plaintiff's solicitor, Truro.
Dated Registrar's Office, Truro, Jan. 13, 1858.

In the Court of Vice-Wardens of the Stannaries.—Stannaries of Cornwall.

In the Cause of TODD v. DOWNING and OTHERS.
IN RE SWANPOOL MINE.
NOTICE IS HEREBY GIVEN, that, pursuant to an ORDER, or DECREE, made in the above-mentioned Cause, and bearing date the 21st day of September last, a PUBLIC AUCTION will be HELD at the Registrar's Office, Truro, on Wednesday, the 27th day of January inst., at Twelve o'clock at noon, for SELLING 106 (1800th) PARTS, or SHARES, of the Defendant John Robert Chidley, of and in the said mine, or as many of the said several shares of the said defendant, John Robert Chidley, as may be necessary to satisfy the said Order, or Decree, and of and in the ORES, HALVANS, ENGINES, MACHINERY, and MATERIALS, and OTHER EFFECTS upon and belonging to the said Mines.—For further information, application may be made to Messrs. HOBBS and HOCKIN, plaintiff's solicitors, Truro.—Dated Registrar's Office, Truro, Jan. 13, 1858.

IMPORTANT TIN MINE IN ST. JUST, PENWITH, CORNWALL, FOR SALE.

MR. BELLINGER WILL SELL, BY AUCTION, on Monday, the 18th day of January next, at Three o'clock in the afternoon, at the Three Tuns Hotel, Penzance, in One Lot, on such conditions as shall be then produced, the SETTS of BALLEWIDEN MINE, in St. Just, with the DRAFT ENGINE, 45 in. cylinder, with two boilers; STEAM STAMPS, of 38 in. cylinder, with two boilers; THREE STEAM WHIMS, with four boilers; and OTHER MACHINERY, ERECTIONS, and PLANT, of every description, as the mine stands, in full operation and working order.
View the mine, and inspect the sets, may be obtained at the office of Mr. R. V. DAVY, the purchaser, East-street, Penzance, and at the offices of the auctioneer, and Messrs. MILLET and BORSLEY, solicitors, Penzance.
Dated Dec. 28, 1857.

TECHON COLLIERY, NEAR BYNEA AND LOUGHER. IMPORTANT TO COLLIERY PROPRIETORS, IRONFOUNDERS, CONTRACTORS, AND OTHERS.

MR. E. MORGAN DOUGLAS has received instructions to SELL, BY AUCTION, on Wednesday, the 27th January, 1858, at TECHON COLLIERY, ALL the valuable and extensive PLANT, ENGINES, BOILERS, RAILS, PUMPS, WAGGONS, &c. Full particulars in next week's *Mining Journal*.
The colliery is very conveniently situated for the removal of the plant, as it is close to the Bynea Station on the Llanelli and Llandovery Railway, the rails leading from the colliery to the railway.—Market-street, Llanelli, Jan. 11, 1858.

SOUTH WALES.—MR. ARTHUR O. DAVIES, of Dowlais, is authorized to TREAT for the SALE of TWO VERY VALUABLE GOING COLLIERIES in South Wales.
Also, TO LET, an EXTENSIVE TRACT OF STEAM COAL, on a long lease, at a moderate royalty, with a railway running through the property.
For terms, apply as above.

IMPORTANT TO CAPITALISTS.—IRELAND.

TO BE SOLD, BY PRIVATE CONTRACT, A VERY VALUABLE MINERAL PROPERTY ON CORK HARBOUR.—This comprises an all but inexhaustible supply of the PUREST WHITE SLATE now known in Great Britain or Ireland, and proved to be peculiarly adapted for the finest porcelain and flint glass; CLAYS in great abundance, for coarse earthenware, bricks, tiles, &c.; also, about 20 acres of RICH BROWN HEMATITE IRON ORE, thickness of bed 6 ft. to 8 ft.; with some MANGANESE.
The situation, as regards the exportation of the produce and facilities of working, is, perhaps, unrivalled, and the concern is in good working order. No other part of Ireland can compete with this site for an extensive and varied manufacture of earthenware, flint, and even crown glass articles, which, though of vast consumption, are yet still imported.
The brick and tile yard, already established, and capable of great expansion, will yield a large and steady profit. The owner will either enter into partnership, or reinvest a considerable sum in a company (limited), with sufficient capital to develop the great capabilities of these mines.
Mr. JAS. DRENNING, C.E., Rosellian, near Cork; or Messrs. TUCKER and DUNSMORE, solicitors, 54, Grand Parade, Cork; may be applied to for further information.

FOR SALE, at the WATER-WORKS, Lower-road, BRIGHTON:
A 20-horse power HIGH-PRESSURE TABLE ENGINE, with Cornish boiler, 24 ft. long, 4 ft. 6 in. diameter, and fittings, complete.
A 40-horse CORNISH DIRECT ACTING HIGH-PRESSURE ENGINE, working a plunger pump at the bottom of a well 70 ft. deep.
A 95-horse DIRECT ACTING HIGH-PRESSURE PUMPING ENGINE, erected in 1852 by the celebrated firm of Hawthorn and Co., Newcastle, complete, with pumps, capable of raising 1200 gallons per minute to the height of 250 ft.
Also, a capital STAND PIPE, 50 ft. high, complete, with all connections.
The above are all in good working order, and are to be disposed of in consequence of an entire alteration in the system of water supply. They can be seen on application at the Water Company's Office, Bond-street, Brighton; and full particulars can be obtained of Messrs. KAYSON and AXON, Grove, Southwark, London, S.E.

NEW LODGE COLLIERY TO BE LET, situated near Pembrey, Carmarthenshire, consisting of several veins of BITUMINOUS COAL, but chiefly of a COLLIER, opened and at work on a vein of about 3 feet thick. The new tenant would have to take to the plant at a valuation, which, with the colliery, would be delivered up in repair, in accordance with the covenants of the existing lease. There is a large copper works and floating harbour connected to the colliery by about one mile of tramroad; the South Wales Railway siding being also in connection with the same. The quality of the coal is suitable for smelting, for smiths' and house purposes, as well as for steam-engines.
For further particulars, apply to Messrs. WHITE, BROUGHTON, and WHITE, solicitors, 12, Great Marlborough-street, W., London; Mr. GEORGE GOODE, Carmarthen; Mr. W. P. SERRYS, C.E., Swansea.

PARISH OF STOKES-UPON-TRENT.—SURVEY AND VALUATION.—An order having been received from the Poor Law Board for a NEW SURVEY and VALUATION of this parish, the Board of Guardians are ready to receive TENDERS from parties desirous of CONTRACTING for the same. The parish is partly mining, manufacturing, and agricultural. It contains about 11,705 A. 2s. 21p., and, according to the last census, there were about 11,224 houses, besides manufactories and mills, which number has been since considerably increased. There are maps or plans of the several townships within the parish; these, so far as relates to the agricultural part, would be required to be altered, so as to show upon the new plans the various alterations which have been made in the various fields, so that the new reference book might agree with the Nos. upon the plans.
The Guardians will receive tenders for the survey and valuation of the land, buildings, and mining property, together, or a separate tender for the land, and also a separate tender for the buildings and mining property.
The party contracting will be required to enter into a bond with two sureties for the due and faithful performance of the contract. It is, therefore, requisite the party tendering should give the names of two respectable parties as sureties, together with references.
Tenders, containing full and explicit terms, to be sent to the Clerk of the Guardians, on or before Ten o'clock in the morning of Wednesday, the 27th inst.
By order, THOS. GRIFFIN, Clerk to Guardians.
Parish Office, Stoke-upon-Trent, Staffordshire, Jan. 6, 1858.

ENGINEERS' TOOLS TO BE SOLD.—A LARGE STOCK of NEW and SECOND-HAND SLIDE and SCREW-CUTTING LATHES, from 6 to 24 in. centres, and from 4 to 24 ft. long; PLANING MACHINES, self-acting in the vertical, angular, and horizontal cuts; from 4 to 24 ft. long; SINGLE and DOUBLE GEARED DRILLING MACHINES, of the latest and most improved construction; also, SCREWING, SLOTTING, SHEARING, and PUNCHING MACHINES, and all kinds of ENGINEERS' TOOLS, either in stock, or made to order.
—Tracings of the above will be sent, and the tools may be seen, on application to Messrs. HENRY ASHPOETH and SONS, Exchange-square, Lincoln-street, Nottingham.

TO PREVENT ACCIDENTS BY WINDING OVER THE HEAD GEAR.—USE THE PATENT SELF-ACTING STEAM BREAK, which at every lift from the mine shuts off the steam from the winding engine and applies the break, according to the number of lifts made.—For illustrated circular and price, apply to HENRY COOPER, engineer, St. Mary's, Manchester.

TO PREVENT RUST IN STEAM BOILERS, USE THE VARNISH made for that purpose by JOHN METCALF, Miles Plating Chemical Works, Manchester. Tenpence per gallon, with instructions for use.

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A short pamphlet, entitled "Hints to Inventors desirous of obtaining Letters Patent for their Inventions, or of Protecting their Designs by Registration," will be forwarded on application.
Messrs. W. and J. H. JOHNSON are proprietors of the PRACTICAL MECHANICS' JOURNAL, an Illustrated Record of Engineering and Mechanical Inventions, Monthly, 1s., containing 25 quarto double-columned pages of text-press, illustrated by Two Plate Engravings, and from 40 to 50 Woodcuts. Edited by W. JOHNSON, C.E. First Series, with Index, complete, Vols. I. to VIII., and Vol. I., New Series, 14s. each, bound in cloth.
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STEAM UNDER SIXTY DAYS ECLIPSED.—The Manco Polo of this line sailed with the steamship ROYAL CHARTER from Melbourne, and arrived in Liverpool eight days before her. PASSAGE MONEY £14 AND UPWARDS.

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Ship.	Register.	Barthen.	Captain.	Date.
SCOTTISH CHIEF	1952	3000	BUCHAN	5th February.
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GREAT TASMANIA	2140	4500	—	To follow.

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The Black Ball Line has had the distinguished honour of a visit from Her Majesty the Queen, who was most graciously pleased to say that she had no idea there were such magnificent ships in her merchant navy. Freight and passage, apply to the owners, JAMES BAIRD & Co., Liverpool; or to T. M. MACKAY & Co., 2, Moorgate-street, London, E.C.

PUMPING AND WINDING ENGINES.—FOR SALE, an excellent 50 in. PUMPING ENGINE, 10 ft. stroke, two boilers 10 tons each, in perfect condition, nearly new, with fire-proof house. A 24 in. WHIM HORIZONTAL ENGINE, with 10 tons boiler, nearly new, in excellent condition, and drawing machine attached.

As these engines are very superior in make and condition, parties requiring engines will do well to examine them.—Apply to Mr. C. WISCOMB, 21, Southwark, Exeter.

TO ENGINEERS, SHIP-BUILDERS, AND OTHERS INTERESTED IN SHEET-IRON STRUCTURES.

BERTRAM'S PATENT WELDING PROCESS.—THIS SIMPLE AND EFFICIENT PROCESS FOR UNITING WROUGHT-IRON PLATES in the construction of Marine, Locomotive, and Land Boilers, Ships, Barges, Tanks, Tanks, Bridge Beams, Girders, and Sheet Iron Structures, generally, by WELDING instead of RIVETING, combines, with great ECONOMY OF LABOUR AND MATERIAL, the certainty of greatly INCREASED STRENGTH, PERMANENT SOUNDNESS, and FREEDOM FROM LEAKAGE. This invention having been most satisfactorily tested, the patentee is prepared to GRANT LICENSES FOR THE USE OF HIS PROCESS; and invites the inspection of a HIGH-PRESSURE TUBULAR BOILER, which has been constructed under his immediate direction, and may be seen at the works of the VICTORIA FOUNDRY COMPANY, engineers and ship-builders, Greenwich. Applications for licenses, and particulars of works required, may be obtained at the office, 12, Buckingham-street, Adelphi, W.C., where samples of the welding may be seen. The welding furnaces will be supplied by the patentee's agent.

PATENT WIRE ROPES, ONE-HALF THE COST OF HEMP ROPES.

HENRY J. MORTON AND CO.'S (2, BASINGHALL BUILDINGS, LEEDS) PATENT WIRE ROPES, for the use of MINES, COLLIERIES, RAILWAYS, &c.; one-half the weight of hemp rope, and one-third the cost; one-third the weight of chains, and one-half the cost; in all deep mines these advantages are self-evident. References to most of the principal colliery owners in the kingdom.

GALVANISED SIGNAL CORDS AND KNOCKER LINES; will not rust or corrode, and not affected by the copper water in mines. Very strong, and not at all liable to break. Prices from 15s. per 100 yards.

PATENT ASPHALTED ROOFING FELTS, 10. per foot.

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FAIRBANK'S IMPROVED PATENT WEIGHING MACHINES, for the use of IRONWORKS, COLLIERIES, RAILWAYS, WAREHOUSES, STORES, &c.

The most ACCURATE MACHINES in use, and the cheapest.

MACHINES of all sizes, from 1 cwt. to 30 tons, for RAILWAY WAGONS, CARTS, or WAGONS.

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FIXED COMPLETE, with greatly improved means for purifying, &c.

Works of all sizes, from 10 lights to 500 lights, estimated for. The construction is so simple, that the works can be entrusted to the management of an ordinary labourer or servant. For LIGHTING CORNISH MINES these works are well adapted, and at a cost of one-half below the usual outlay.—Apply to

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These wines, the produce of a British colony which has escaped the vine disease (the vintage occurring in February may account for the same), are, in consequence, wholesome, and are warranted free from acidity and brandy, and are admitted by Her Majesty's Customs at half duty, hence the low price. A Pint Sample Bottle of each for 24 stamps, bottles included. Packages allowed for when returned.

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For LICENSES TO USE the above process, apply to ROBERT LONDON, Jun., 63, King-street, Manchester.

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SHEET ZINC, out of the best selected SILESIA SPELTER, refined and rolled at these mills, CONSTANTLY ON HAND, of all usual gauges, or rolled to order any practicable length, width, or thickness, to suit purchasers, on moderate terms. Also, TELEGRAPH PLATES, SHEATHING FOR VESSELS, &c. OLD ZINC AND SHEATHING PURCHASED. SILESIA SPELTER ON SALE.—Apply to the Manager, at the Mills; or at the office, 3, Harrington-street, Liverpool.

SHORTBRIDGE, HOWELL, AND JESSOP, HARTFORD STEEL WORKS, SHEFFIELD, SOLE MANUFACTURERS OF HOWELL'S PATENT HOMOGENEOUS BOILER-PLATE METAL, combining the strength and durability of steel with the malleability of copper; warranted to bear double the pressure of the best boiler-plate iron; RIVETS, ANGLES, and STAYS of the same material. Also, RUSSELL AND HOWELL'S PATENT CAST-STEEL TUBES, for multibore boilers, shafting, railway axles, &c.

Application to be made to SHORTBRIDGE, HOWELL, and JESSOP, Hartford Steel Works, Sheffield; and Messrs. HARVEY and Co., 12, Haymarket, London.

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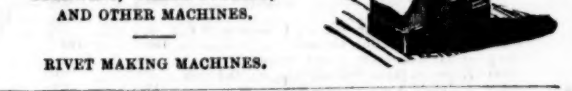
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128	South Crinias (copper), St. Austell	19 1/2	18 1/2	20 1/2	24 1/2	0 30-0-0 June 18, 1855.
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572	Trevelan Consols (tin), St. Ives	11 1/2	11 1/2	12 1/2	14 1/2	0 1-0-0 Feb. 21, 1851.
96	Trevelan (copper), Gwennap, Cornwall	42 1/2	41 1/2	44 1/2	53 1/2	0 5-0-0 June 4, 1855.
120	Trevelan (copper), Gwennap, Cornwall	15 1/2	15 1/2	16 1/2	19 1/2	0 2-0-0 Apr. 29, 1851.
4000	Trevelan (copper), Gwennap, Cornwall	17. 3s. 6d.	16 1/2	19 1/2	23 1/2	0 5-0-0 July 8, 1856.
4096	Trevelan (silver-lead), Menheniot, Cornwall	2 1/2	2 1/2	3 1/2	4 1/2	0 3-0-0 April 2, 1857.
100	Trumpet Consols (tin), near Helston	95 1/2	94 1/2	97 1/2	115 1/2	0 5-0-0 Dec. 20, 1854.
400	United Mines (copper), Gwennap [S.E.]	40 1/2	39 1/2	42 1/2	50 1/2	0 2-0-0 Feb. 12, 1856.
30000	Valley of Towy (lead), Carmarthen [S.E.]	4 1/2	4 1/2	5 1/2	6 1/2	0 3-0-0 June 12, 1857.
512	Wendron Consols (tin), Wendron	234. 7s. 8d.	233 1/2	236 1/2	280 1/2	0 1-0-0 Sept. 22, 1857.
600	West Basset (copper), Illogan [S.E.]	1 1/2	1 1/2	2 1/2	3 1/2	0 10-0-0 Nov. 25, 1857.
256	West Caradon (copper), Liskeard [S.E.]	20 1/2	19 1/2	22 1/2	27 1/2	0 2-0-0 Nov. 25, 1857.
256	West Damsel (copper), Gwennap	80 1/2	79 1/2	82 1/2	95 1/2	0 2-0-0 July 20, 1857.
1024	West Providence (tin), St. Erth	21. 11s. 7d.	20 1/2	23 1/2	28 1/2	0 10-0-0 April 8, 1857.
400	West Wheal Seton (copper), Camborne	38 1/2	37 1/2	40 1/2	48 1/2	0 10-0-0 Dec. 15, 1857.
228	Wheal Arthur (copper), Calstock	6 1/2	6 1/2	7 1/2	8 1/2	0 10-0-0 Dec. 15, 1857.
240	Wheal Bal (tin), St. Just	8 1/2	8 1/2	9 1/2	11 1/2	0 1-0-0 Nov. 14, 1855.
512	Wheal Basset (copper), Illogan [S.E.]	5 1/2	5 1/2	6 1/2	7 1/2	0 4-0-0 Dec. 4, 1857.
256	Wheal Buller (copper), Redruth [S.E.]	5 1/2	5 1/2	6 1/2	7 1/2	0 7-0-0 Nov. 17, 1857.
700	Wheal Clifford (copper), Gwennap	250 1/2	249 1/2	252 1/2	300 1/2	0 3-0-0 Oct. 26, 1857.
8000	Wheal Fortescue, Bodmin	nil.	nil.	1 1/2	2 1/2	0 1-0-0 Jan. 14, 1856.
128	Wheal Friendship (copper), Devon	80 1/2	79 1/2	82 1/2	95 1/2	0 8-0-0 May 10, 1854.
124	Wheal Grylls (copper, tin), Breage	4s. 6d.	4s. 6d.	5s. 6d.	6s. 6d.	0 8-0-0 Feb. 24, 1857.
512	Wheal Jane (silver-lead), Kes.	4 1/2	4 1/2	5 1/2	6 1/2	0 10-0-0 Oct. 16, 1857.
1024	Wheal Kitty (tin), St. Agnes	4 1/2	4 1/2	5 1/2	6 1/2	0 3-0-0 Mar. 24, 1857.
124	Wheal Kitty (tin), Uny Lelant [S.E.]	21. 7s. 2d.	20 1/2	23 1/2	28 1/2	0 1-0-0 Sept. 17, 1857.
430	Wheal Lovell (tin), Wendron	18 1/2	17 1/2	20 1/2	24 1/2	0 1-0-0 Sept. 5, 1856.
418	Wheal Margaret (tin), Uny Lelant	19 1/2	18 1/2	21 1/2	25 1/2	0 2-0-0 Nov. 25, 1857.
1024	Wheal Mary Ann (lead), Menheniot [S.E.]	8 1/2	8 1/2	9 1/2	11 1/2	0 5-0-0 Dec. 15, 1857.
40	Wheal Owses, St. Just, Cornwall	70 1/2	69 1/2	72 1/2	85 1/2	0 5-0-0 Aug. 2, 1857.
240	Wheal Reeth (tin), Uny Lelant	31 1/2	30 1/2	33 1/2	40 1/2	0 3-0-0 Aug. 23, 1853.
198	Wheal Seton (tin, copper), Camborne	107 1/2	106 1/2	109 1/2	130 1/2	0 3-0-0 Oct. 12, 1857.
1640	Wheal Trevelan (all-lead), Liskeard [S.E.]	27 1/2	26 1/2	29 1/2	35 1/2	0 2-0-0 Jan. 11, 1854.
1024	Wheal Trevelan (tin, copper), Gwylvaeth	11. 9s. 6d.	11 1/2	12 1/2	15 1/2	0 2-0-0 Dec. 22, 1857.
5000	Wheal Wrey (lead), St. Ives	14. 9s. 6d.	13 1/2	16 1/2	19 1/2	0 2-0-0 Dec. 22, 1857.
5000	Wicklow (copper), Wicklow	5 1/2	5 1/2	6 1/2	7 1/2	0 10-0-0 Jan. 14, 1858.

* Dividends paid every two months. + Dividends paid every three months.

FOREIGN MINES.

Shares.	Mines.	Paid.	Last Price.	Present.	Dividends per Share.	Last Paid.
10000	Alten and Quansang Un. (cop.), Norway	216 1/2	215 1/2	218 1/2	260 1/2	0 15-0-0 Nov. 21, 1853.
2464	Burra Burra (copper), South Australia	4 1/2	4 1/2	5 1/2	6 1/2	0 5-0-0 Dec. 2, 1857.
12000	Cobre Copper Company (cop.), Cuba [S.E.]	16 1/2	15 1/2	18 1/2	22 1/2	0 1-0-0 July 31, 1857.
10000	Copahu Mining Company, Chili [S.E.]	16 1/2	15 1/2	18 1/2	22 1/2	0 10-0-0 May 9, 1856.
20000	General Mining Assoc., Nova Scotia [S.E.]	20 1/2	19 1/2	22 1/2	27 1/2	0 15-0-0 July 7, 1857.
15000	Linares (lead), Pozo Ancho, Spain [S.E.]	3 1/2	3 1/2	4 1/2	5 1/2	0 5-0-0 Dec. 24, 1857.
10000	Lusitania (of Portugal) [S.E.]	1 1/2	1 1/2	2 1/2	3 1/2	0 5-0-0 May 25, 1857.
173815	Mariguita and New Granada [S.E.]	1 1/2	1 1/2	2 1/2	3 1/2	0 4-0-0 Aug. 20, 1857.
25000	Peninsular Mining Company (Limited)	20 1/2	19 1/2	22 1/2	27 1/2	0 2-0-0 Sept. 29, 1855.
10000	Pontobard (silver-lead), France [S.E.]	20 1/2	19 1/2	22 1/2	27 1/2	0 1-0-0 June 26, 1855.
7000	Royal Santiago (copper), Cuba [S.E.]	15 1/2	14 1/2	17 1/2	20 1/2	0 5-0-0 July 12, 1848.</